

Fig. PA1: MAGNET-Automated Contracting System

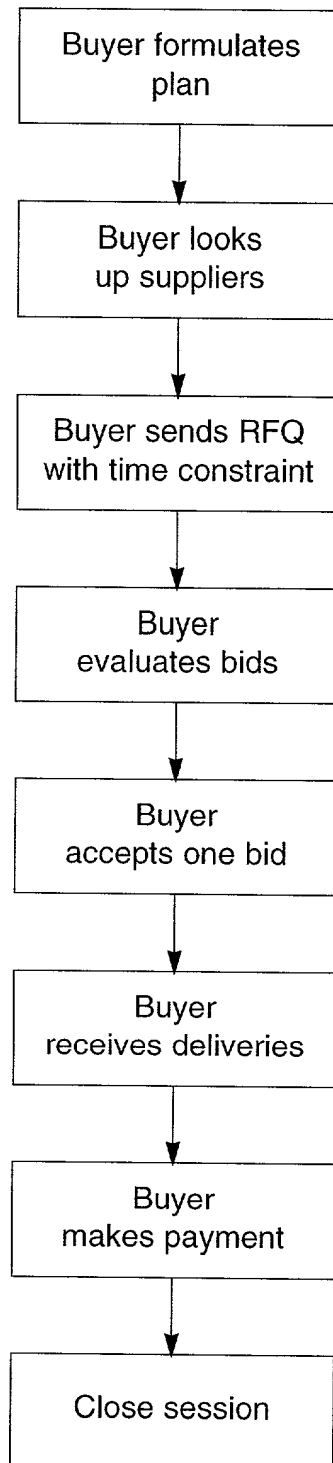


Fig. PA2: Fishmarket

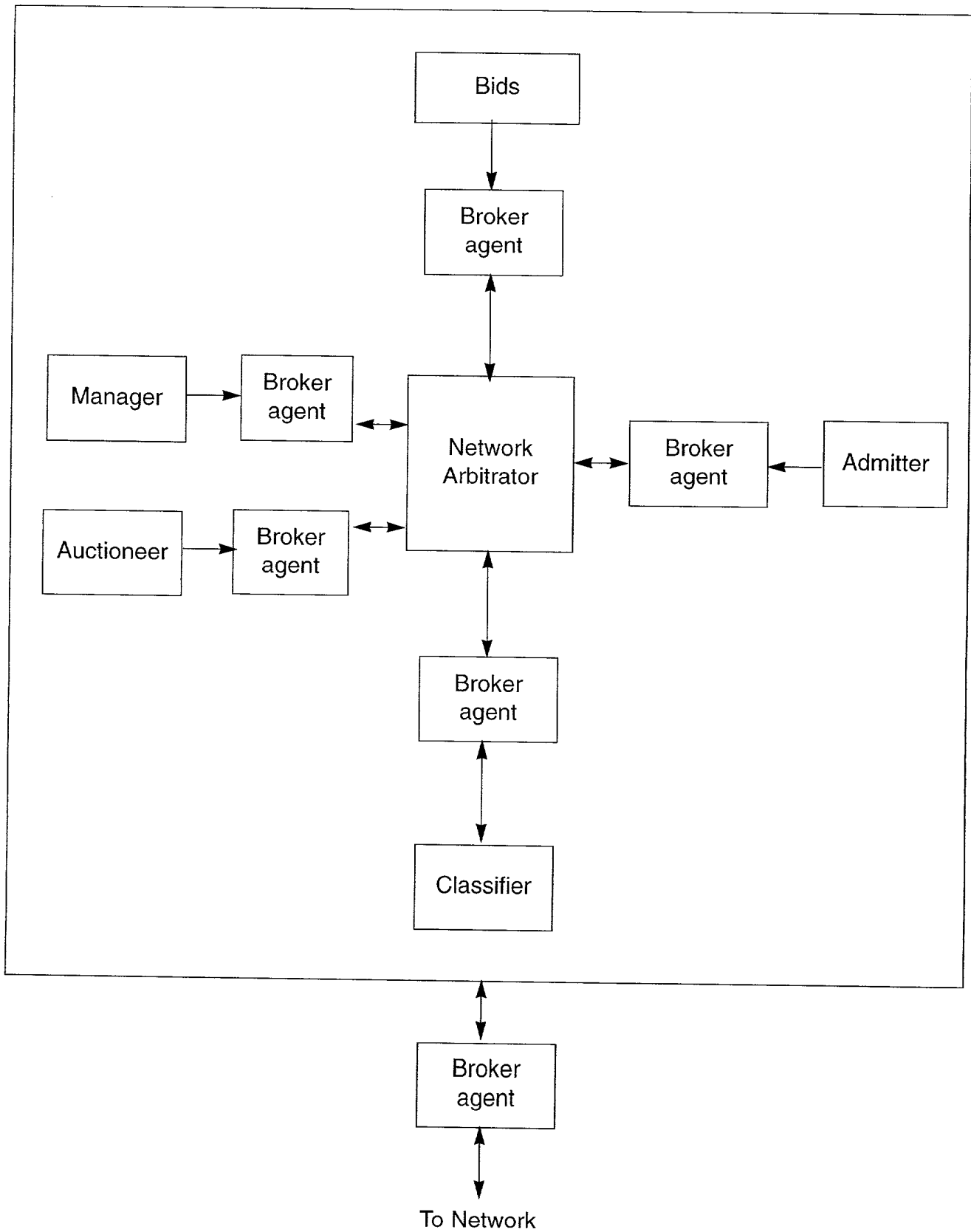


Fig. PA3: Kasbah Marketplace

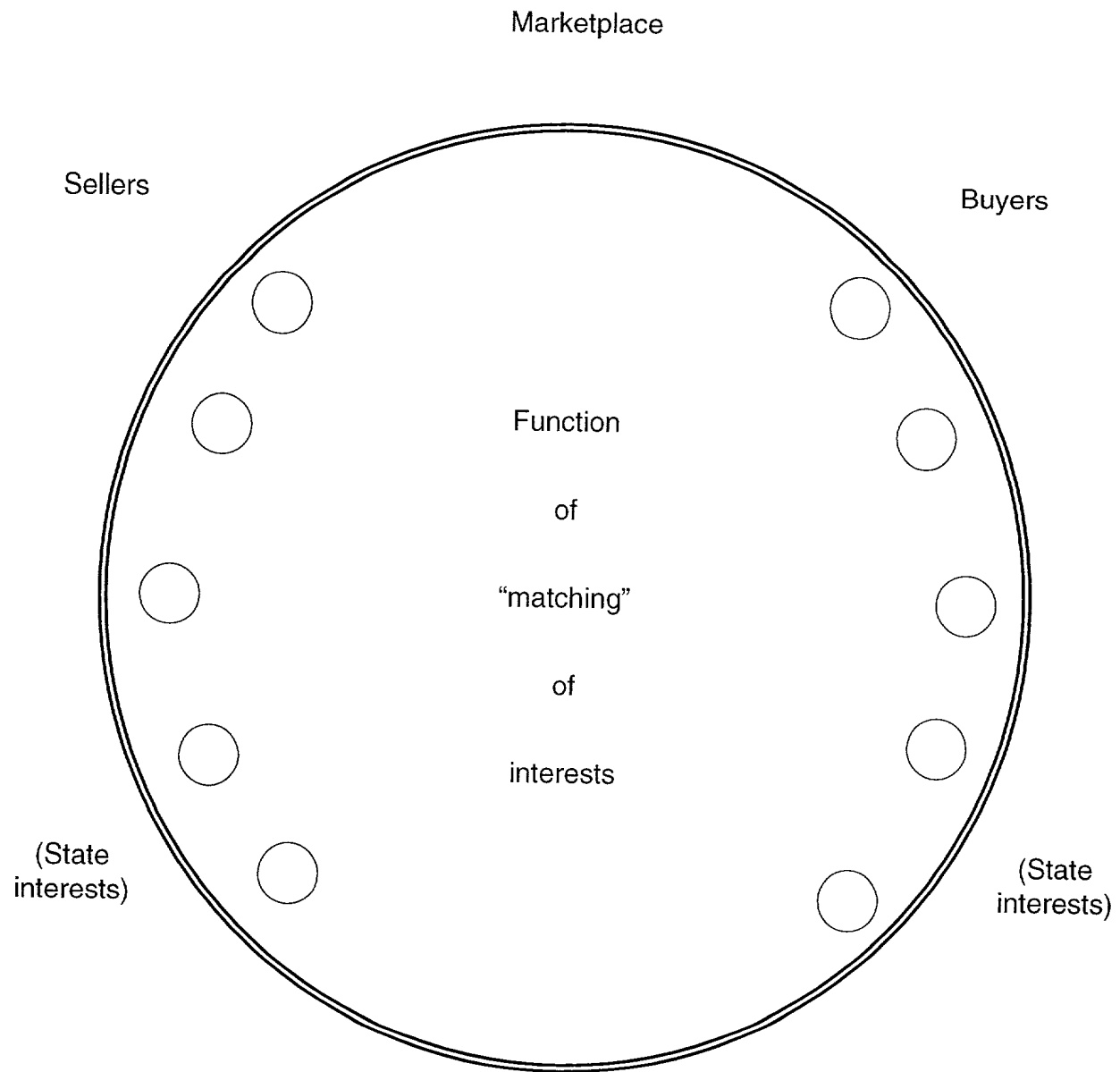


Fig. PA4A: Tete-a-tete (I): Integrative Negotiation

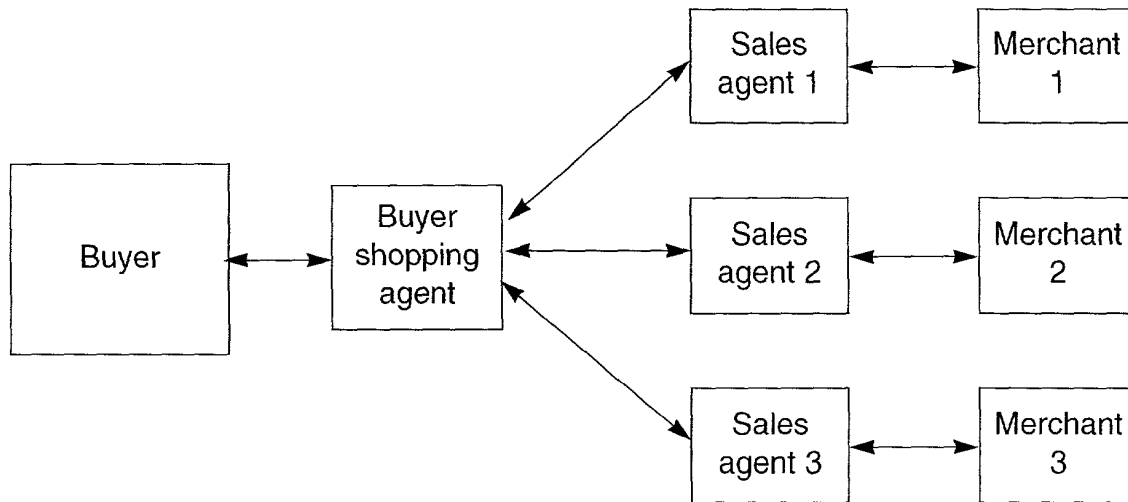


Fig. PA4B: Tete-a-tete (II): Bilateral Negotiation

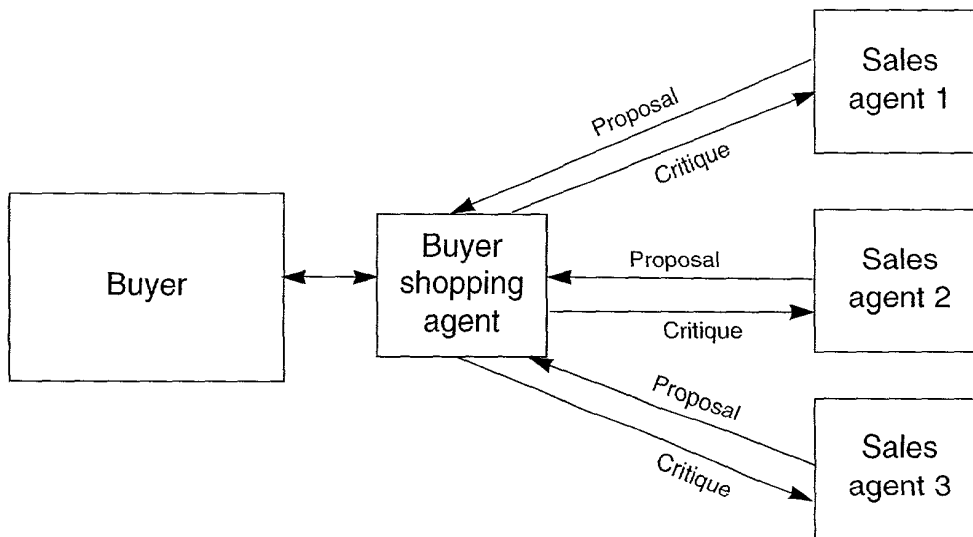


Fig. PA5: Contract Net-4 Stages of the Contract Net

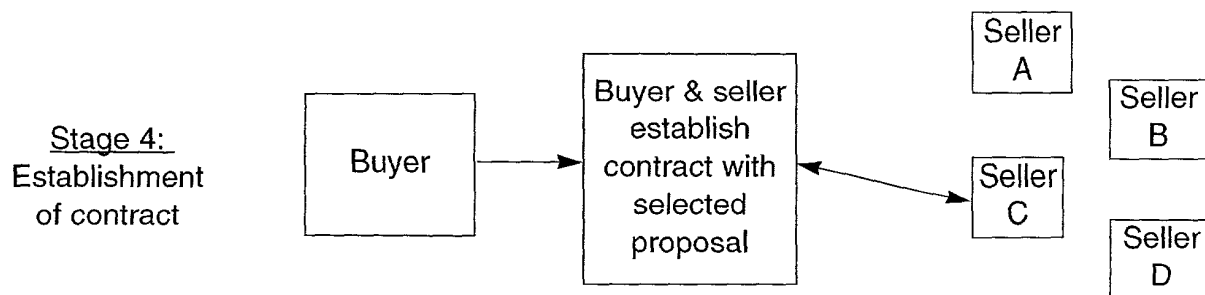
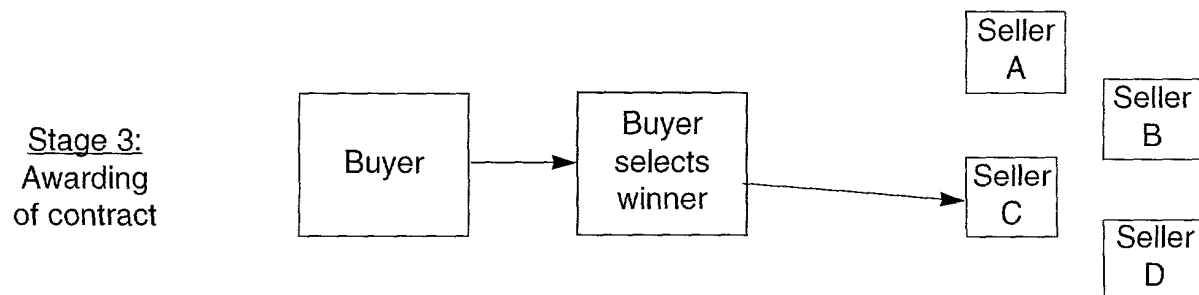
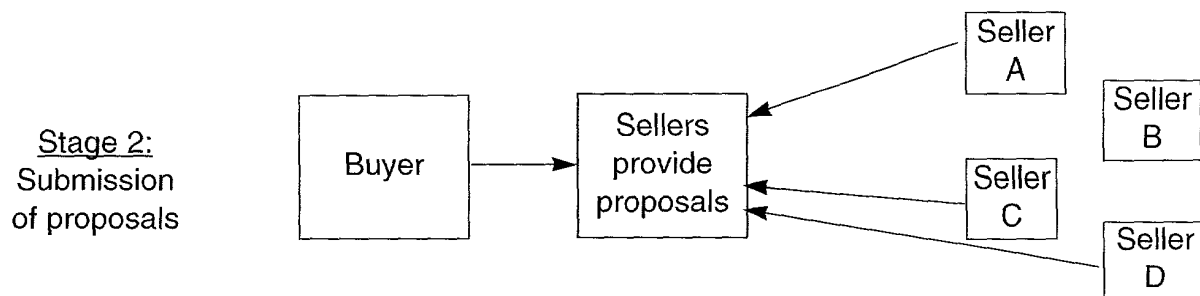
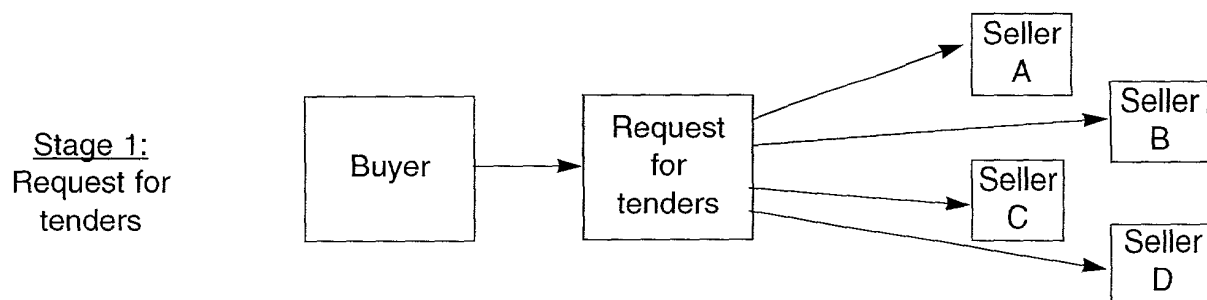


Fig. PA6: Flow Chart Of Contract Net Protocol

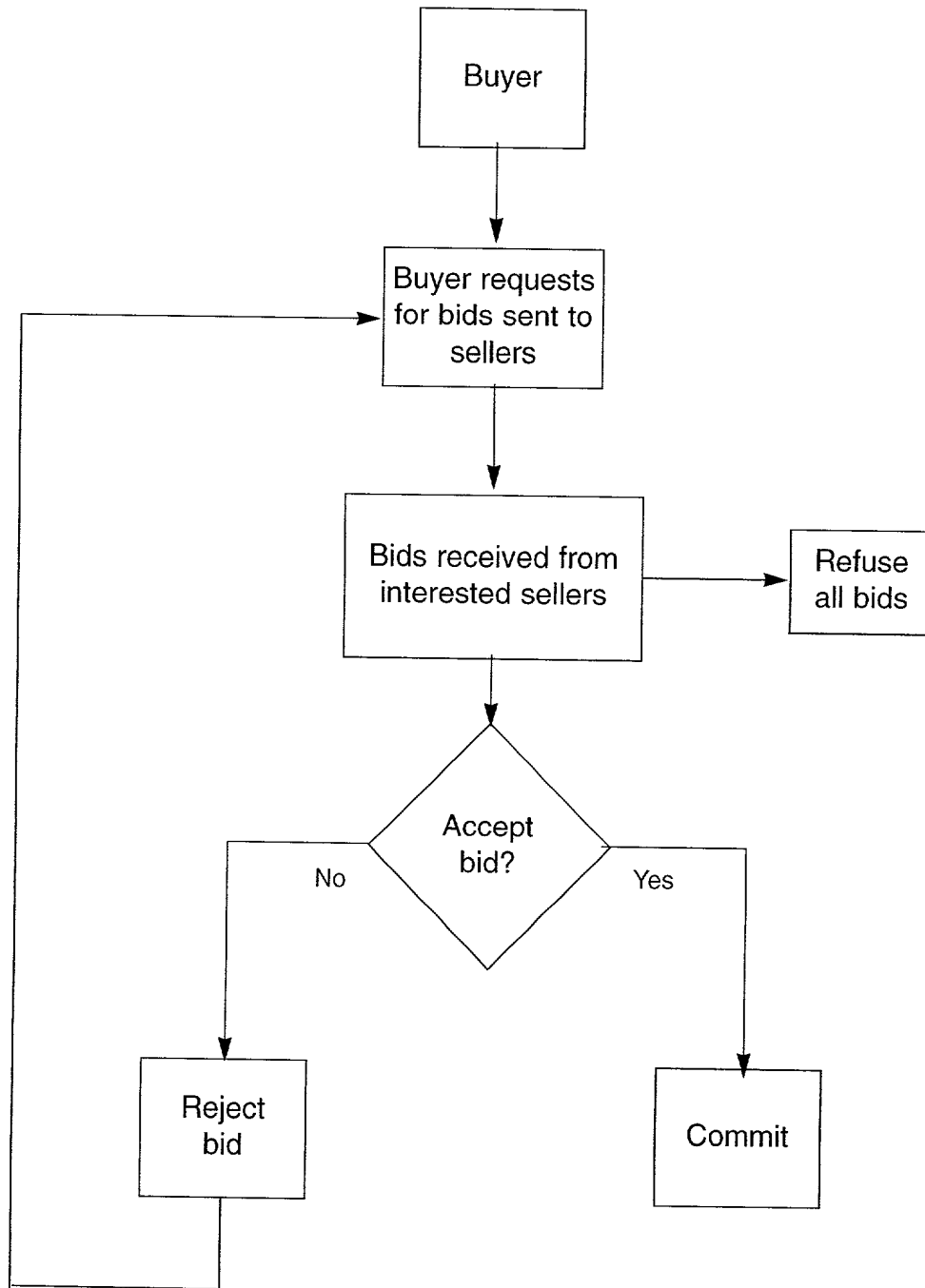


Fig. PA7A: EDI As A Paper Replacement Technique

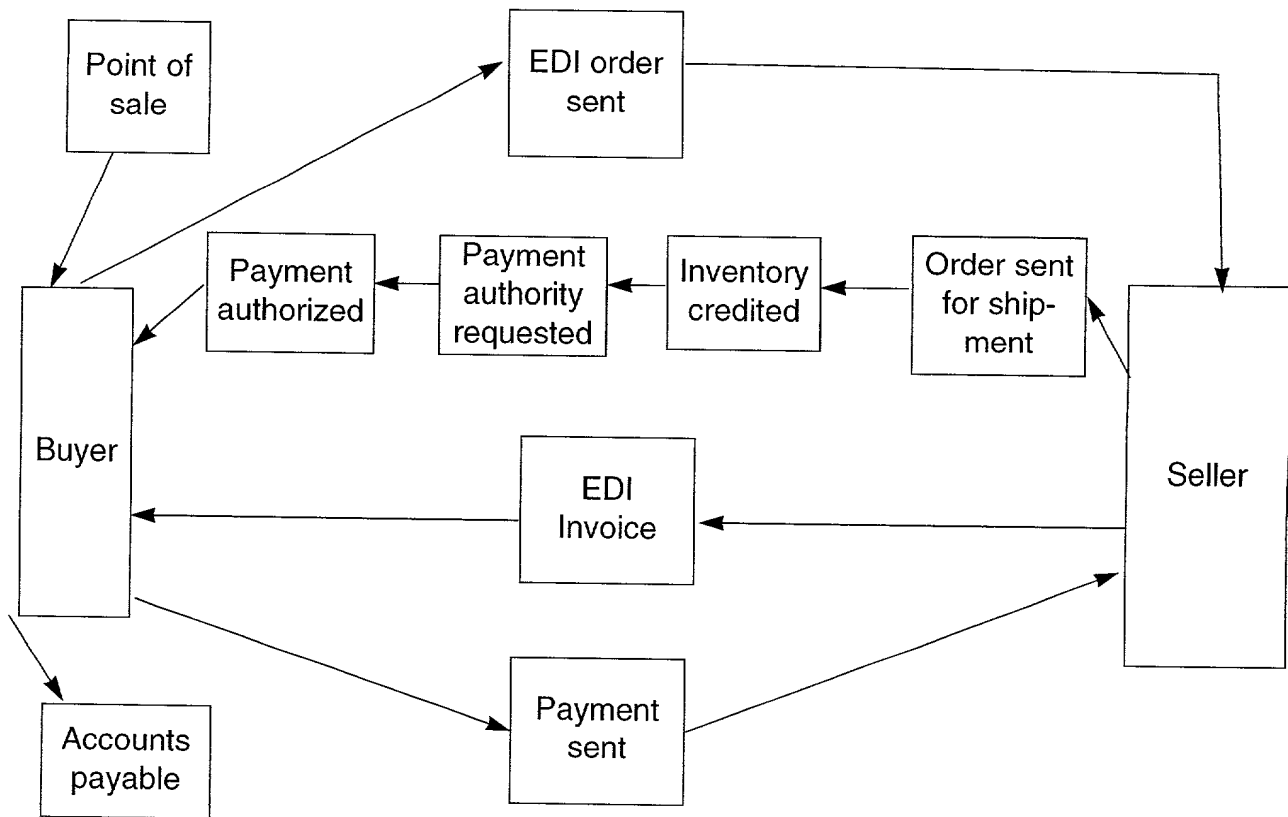


Fig. PA7B: EDI As A Process Elimination Technique

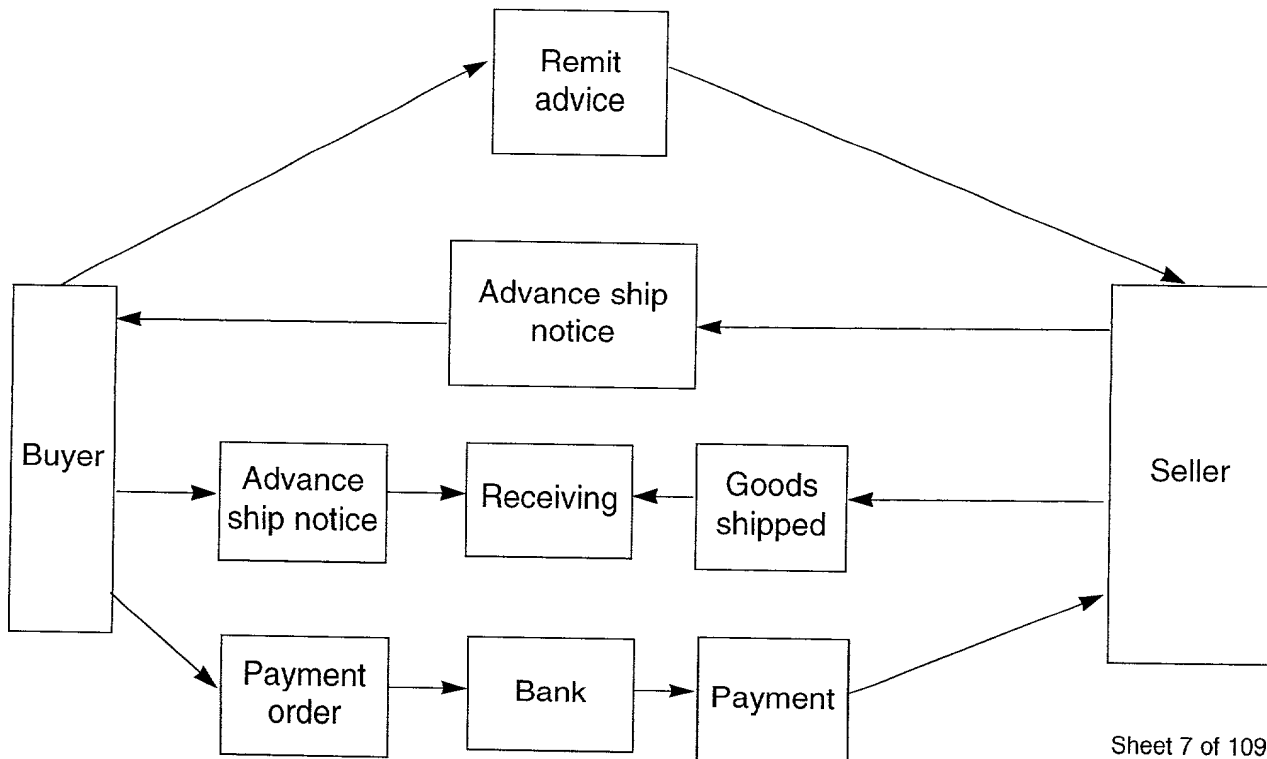


Fig. PA8: ECN (Electronic Communications Network)

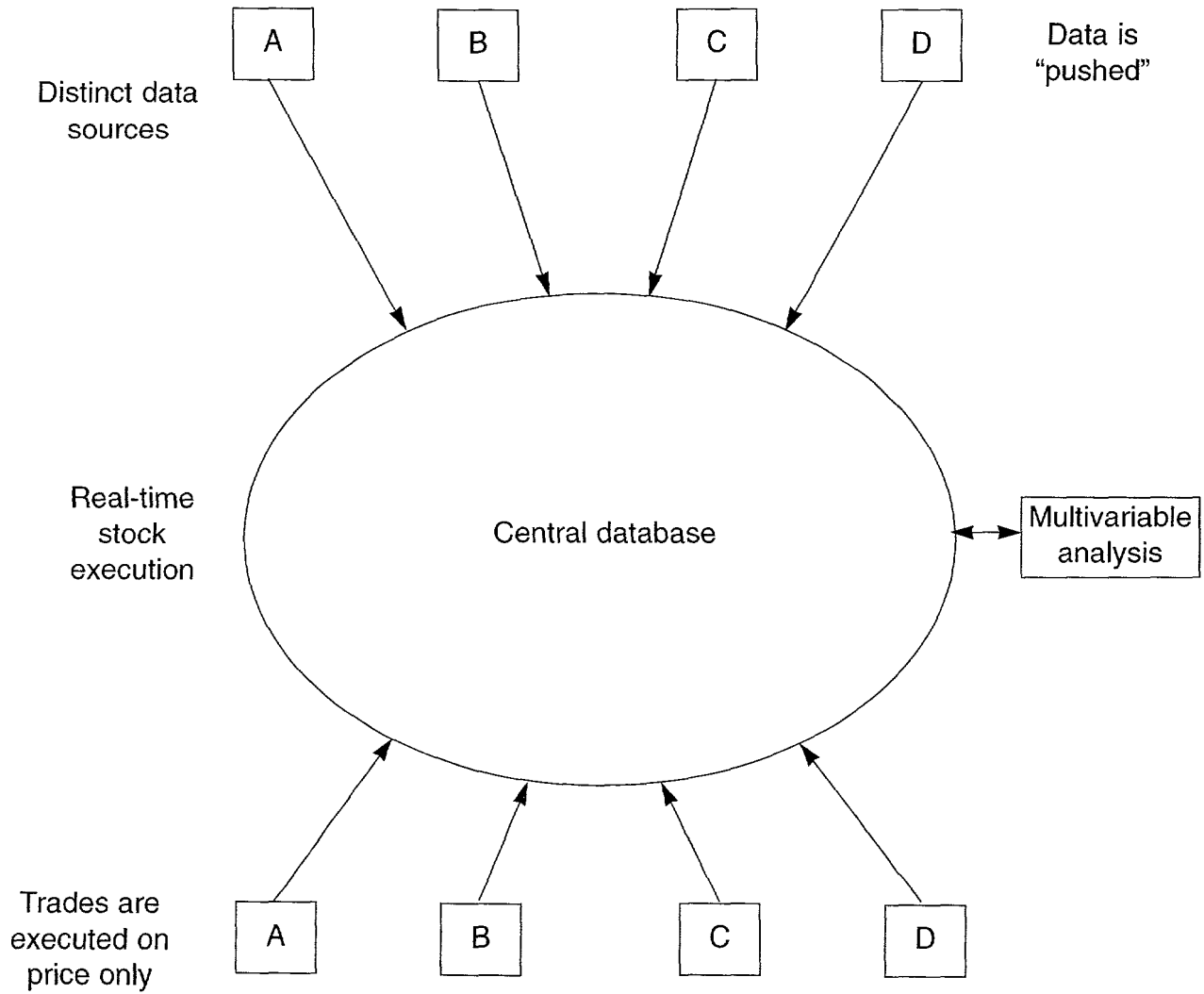


Fig. PA9A: Intermediated Demand-Initiated Procurement System

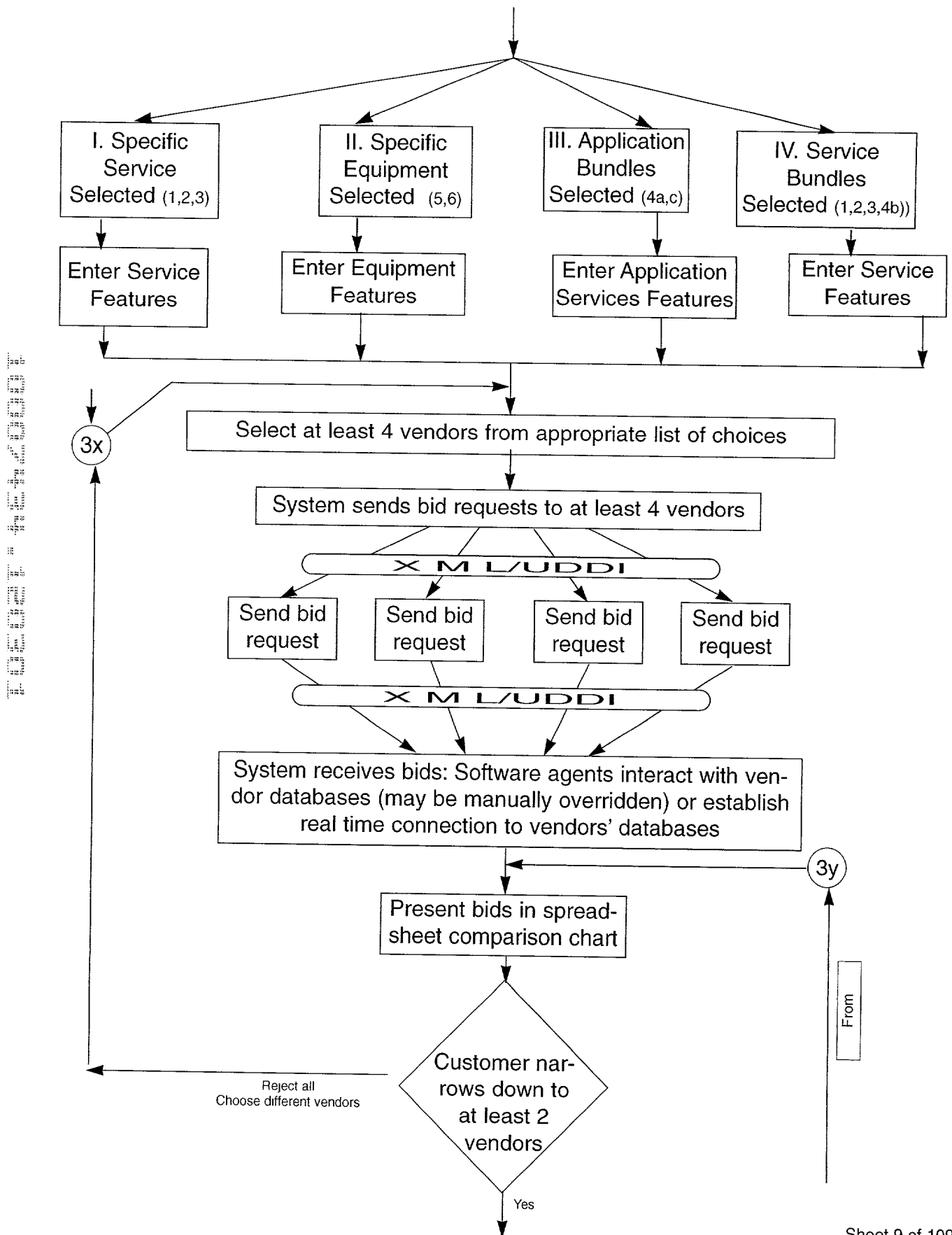


Fig. PA9B: Continued

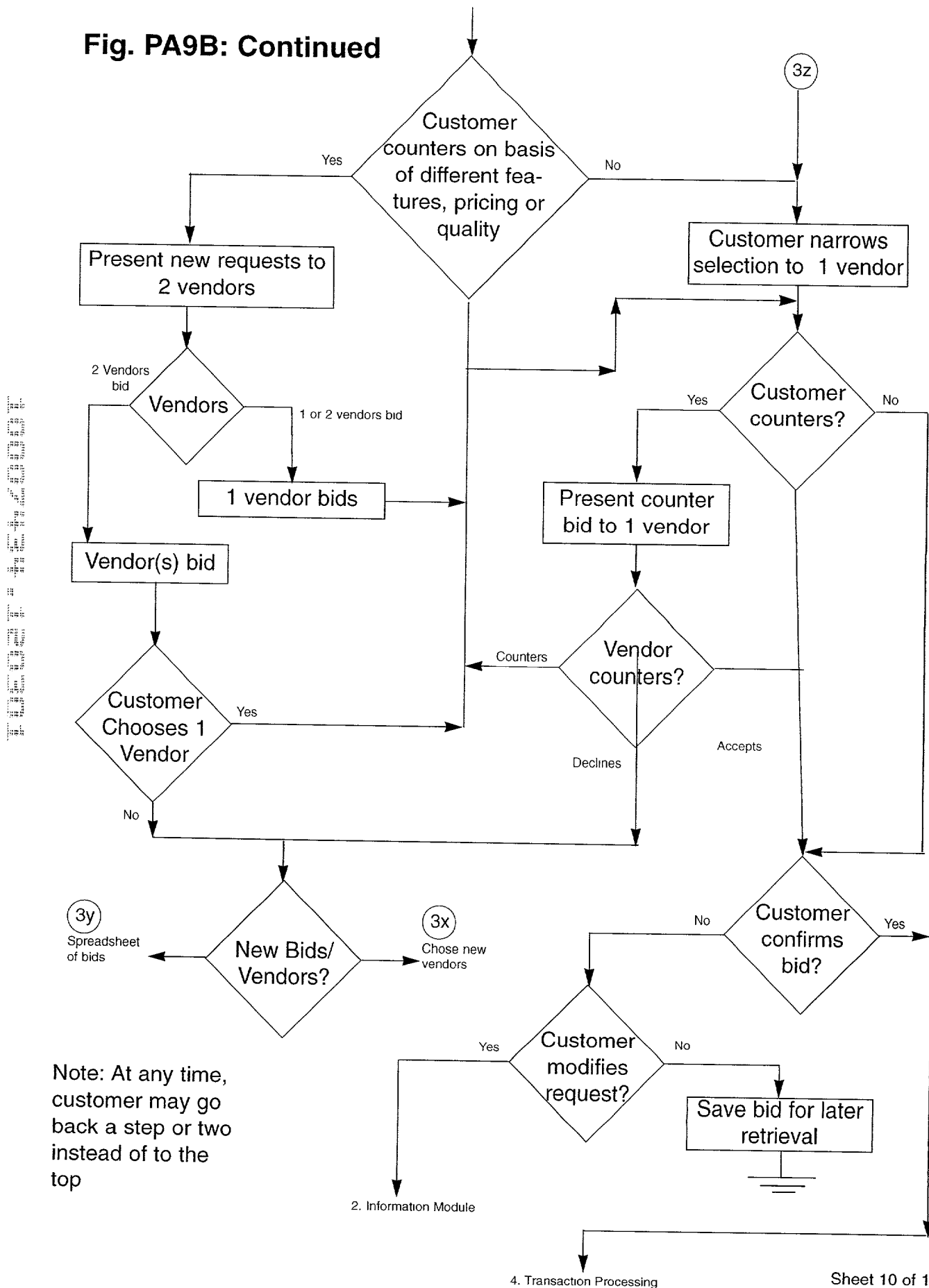


Fig. PA10: Traditional Supply Chain & Customer Relationships

(Small Company Consumers)

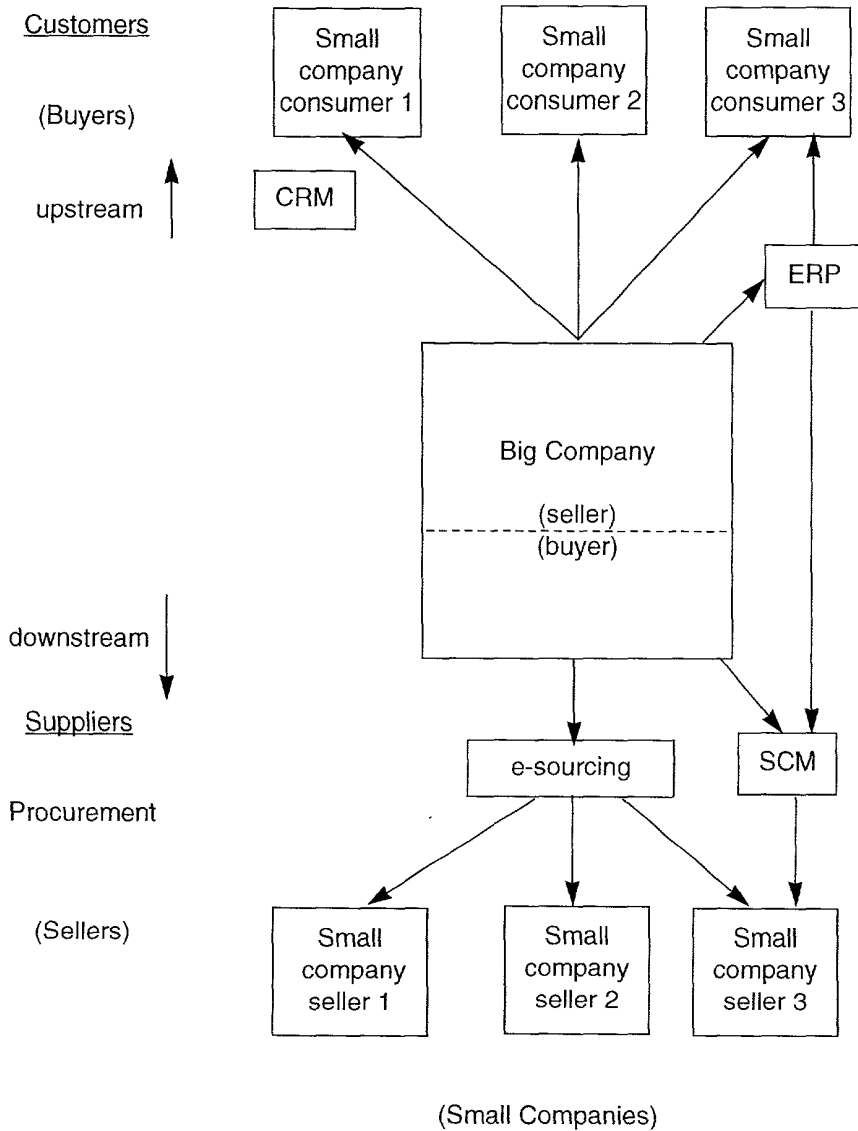


Fig. PA11: Traditional Search Technology

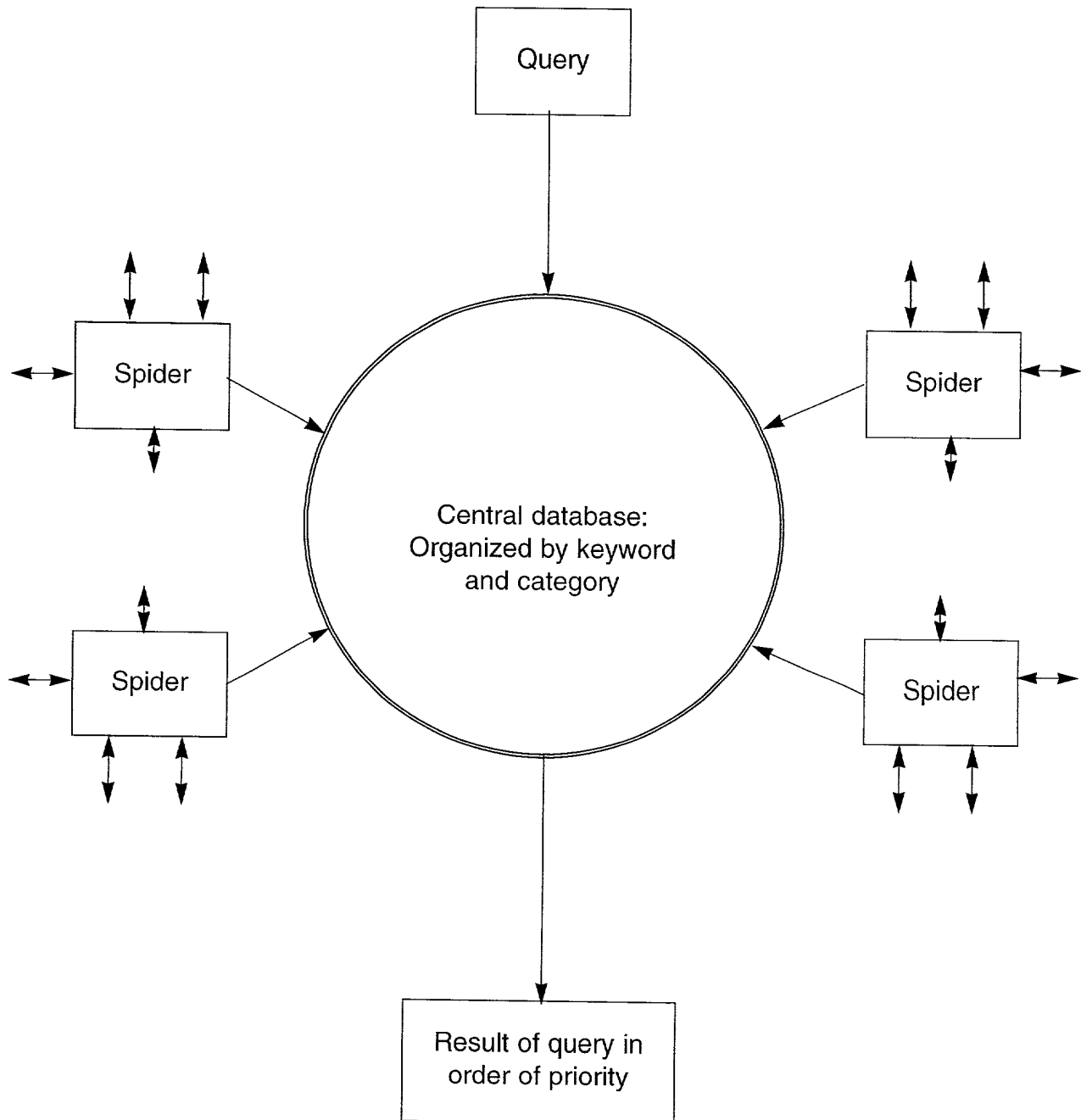


Fig. PA12: Distributed Search Approach

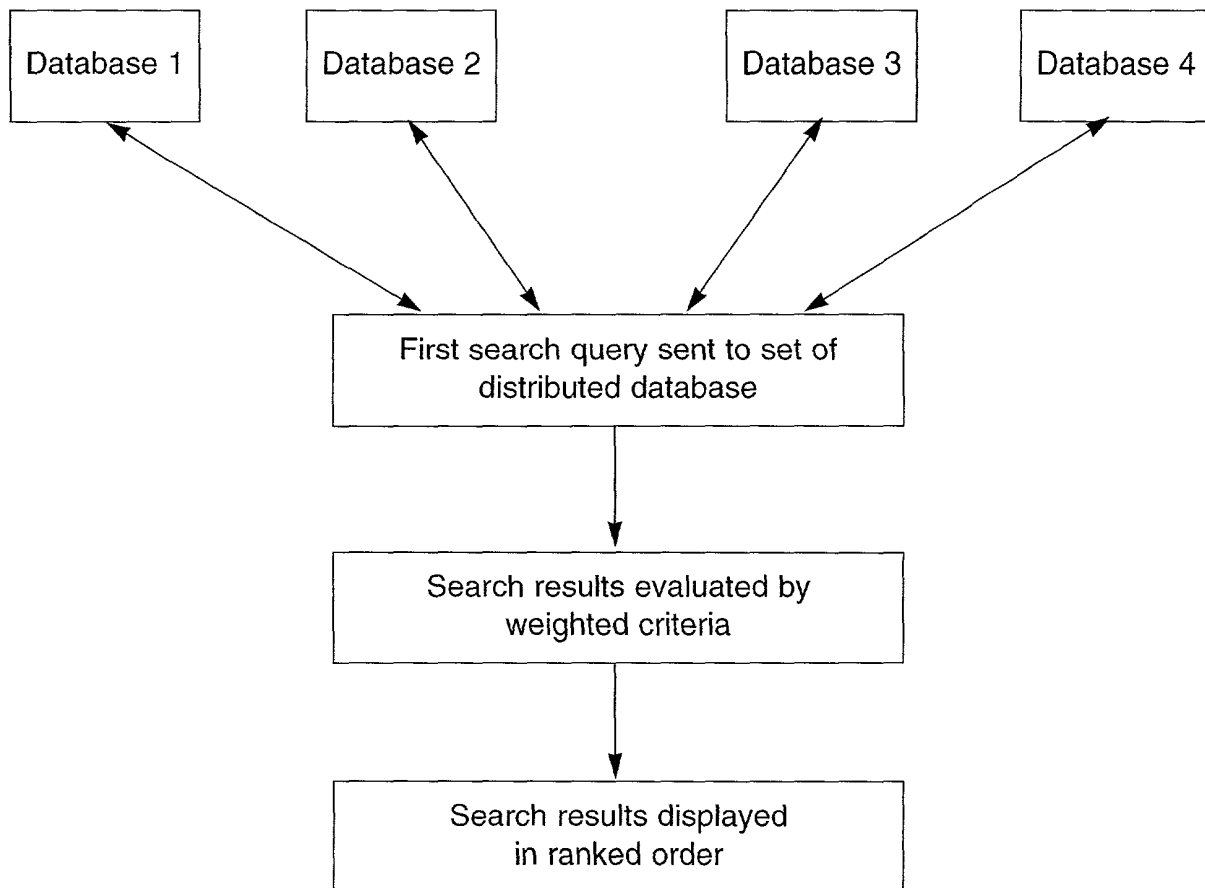


Fig. PA13: Traditional Aggregation

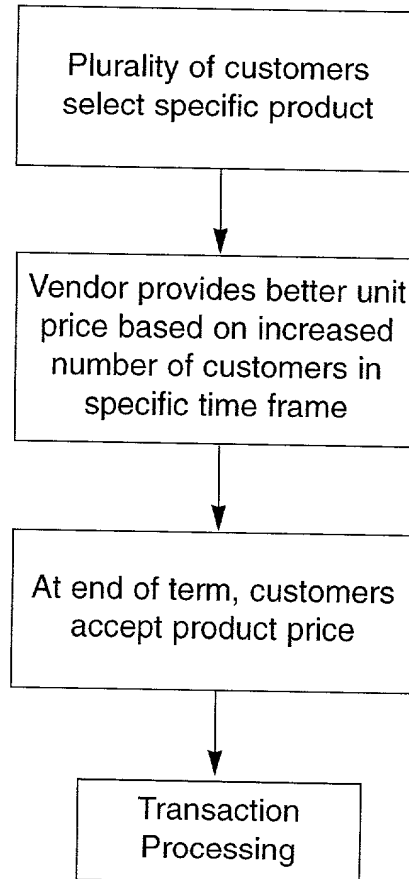


Fig. PA14: Intermediated Option Contracts

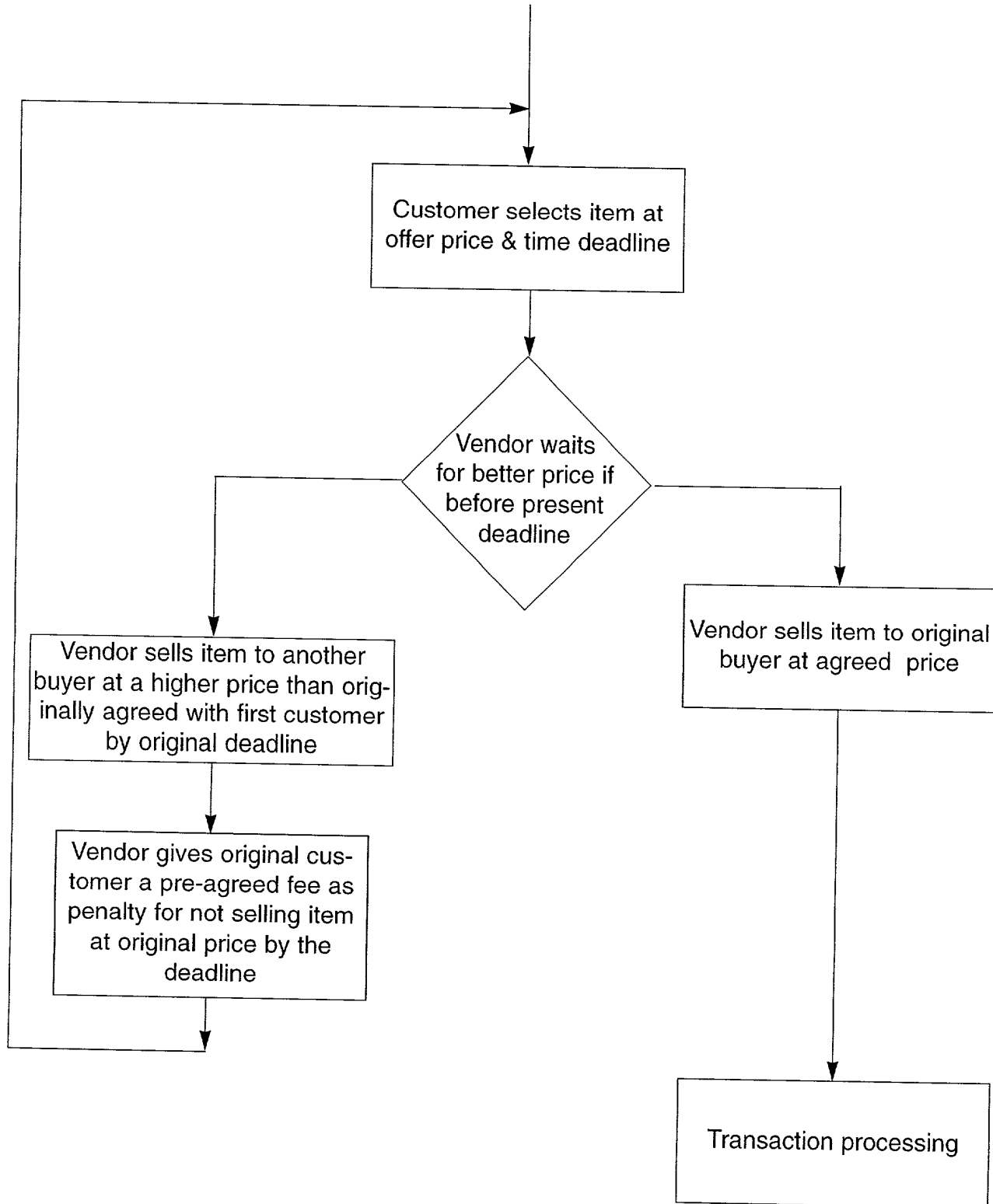


Fig. 1: CCN Architecture

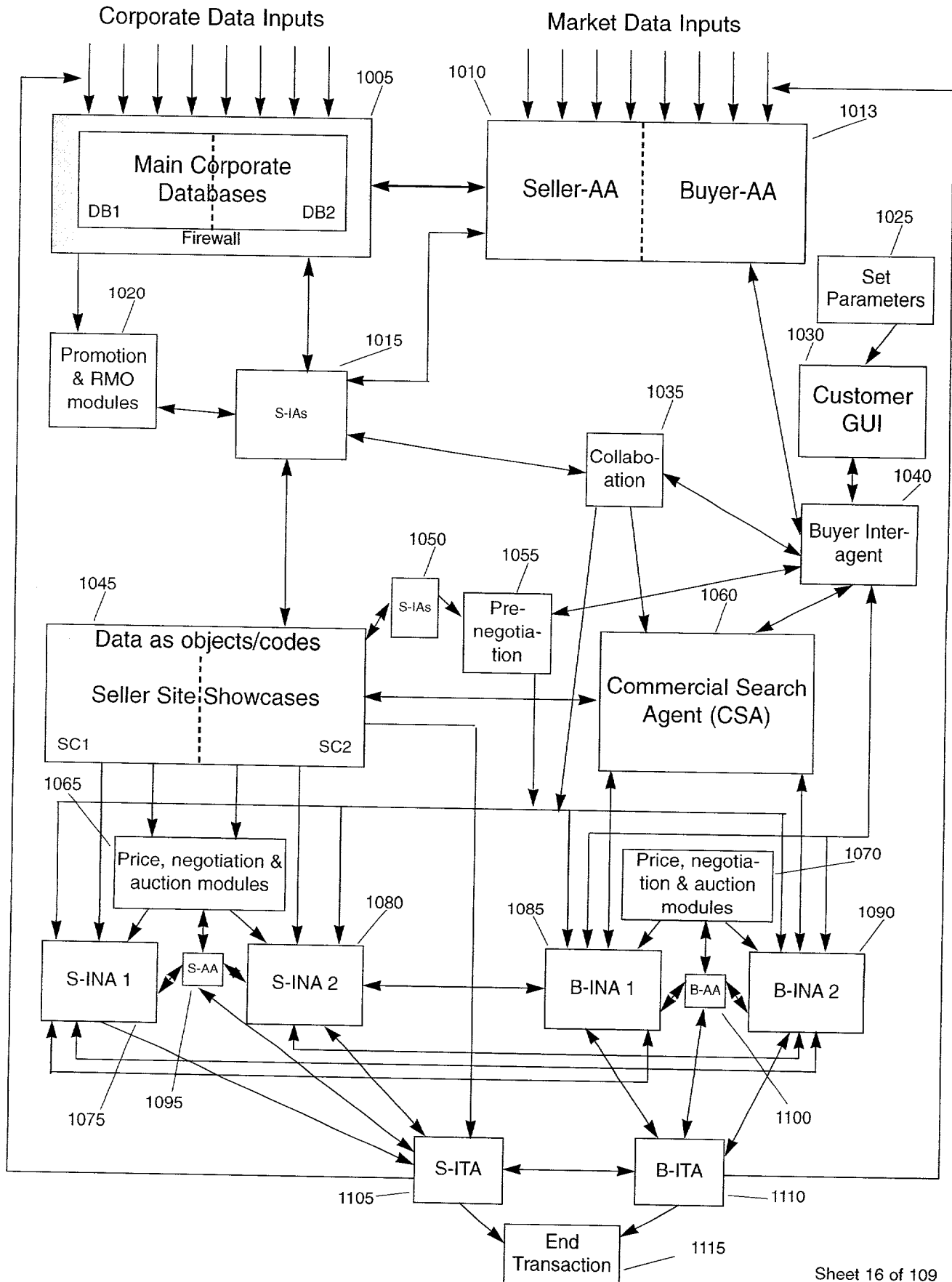


Fig. 3: Showcase Database System

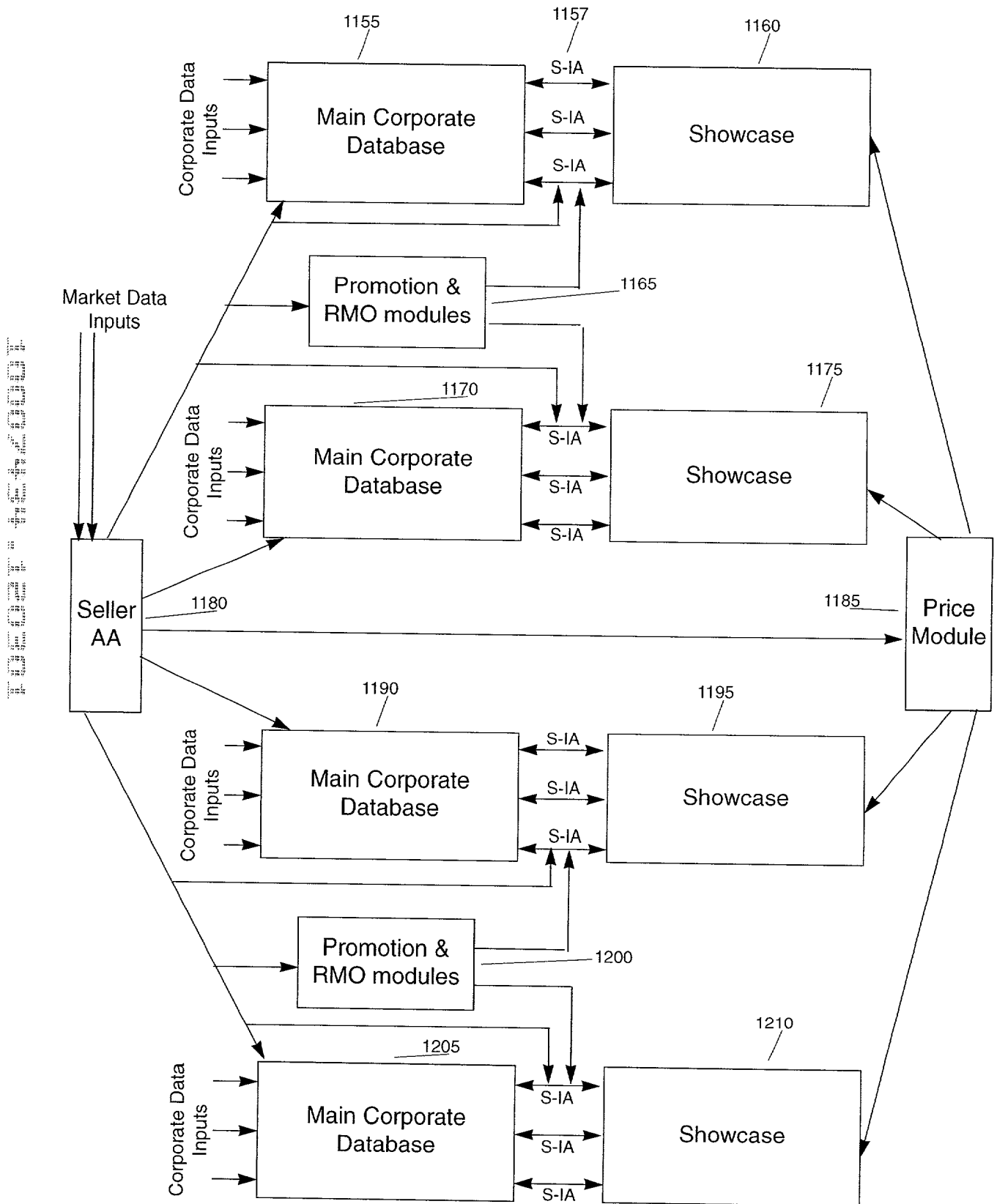
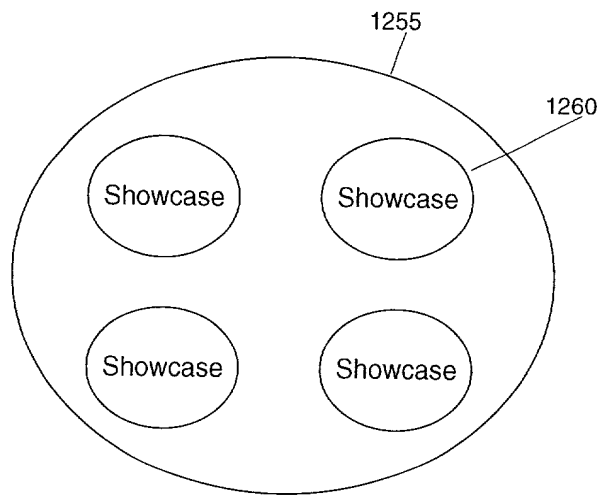
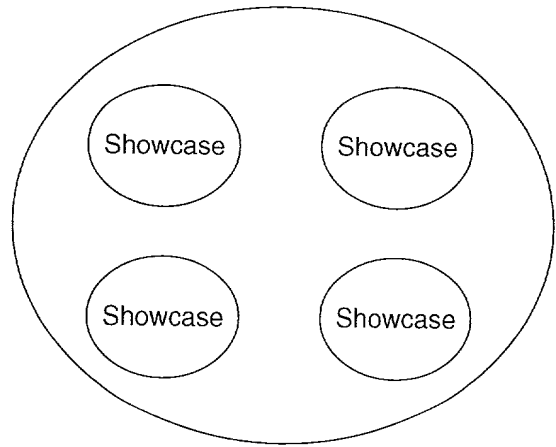


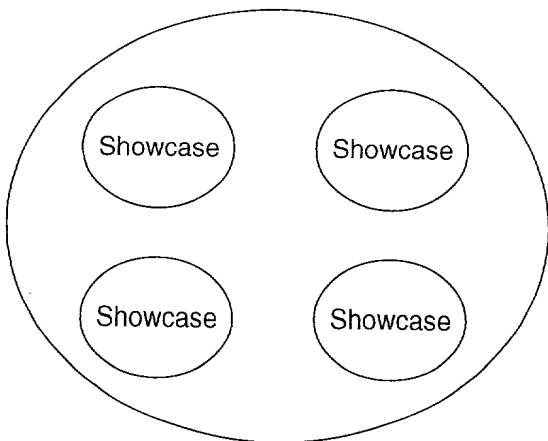
Fig. 4: Multiple Vertical Databases



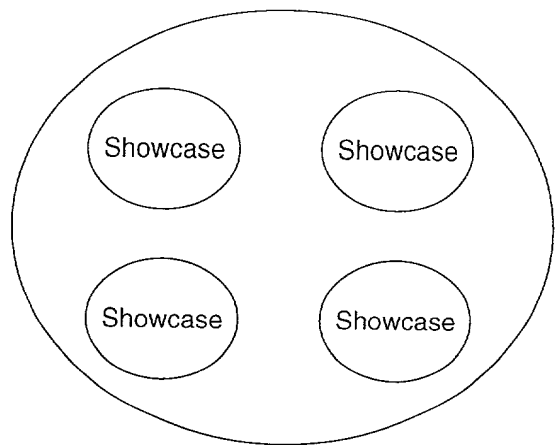
Specific Industry A



Specific Industry B



Specific Industry C



Specific Industry D

Fig. 6: Showcase Database Operation

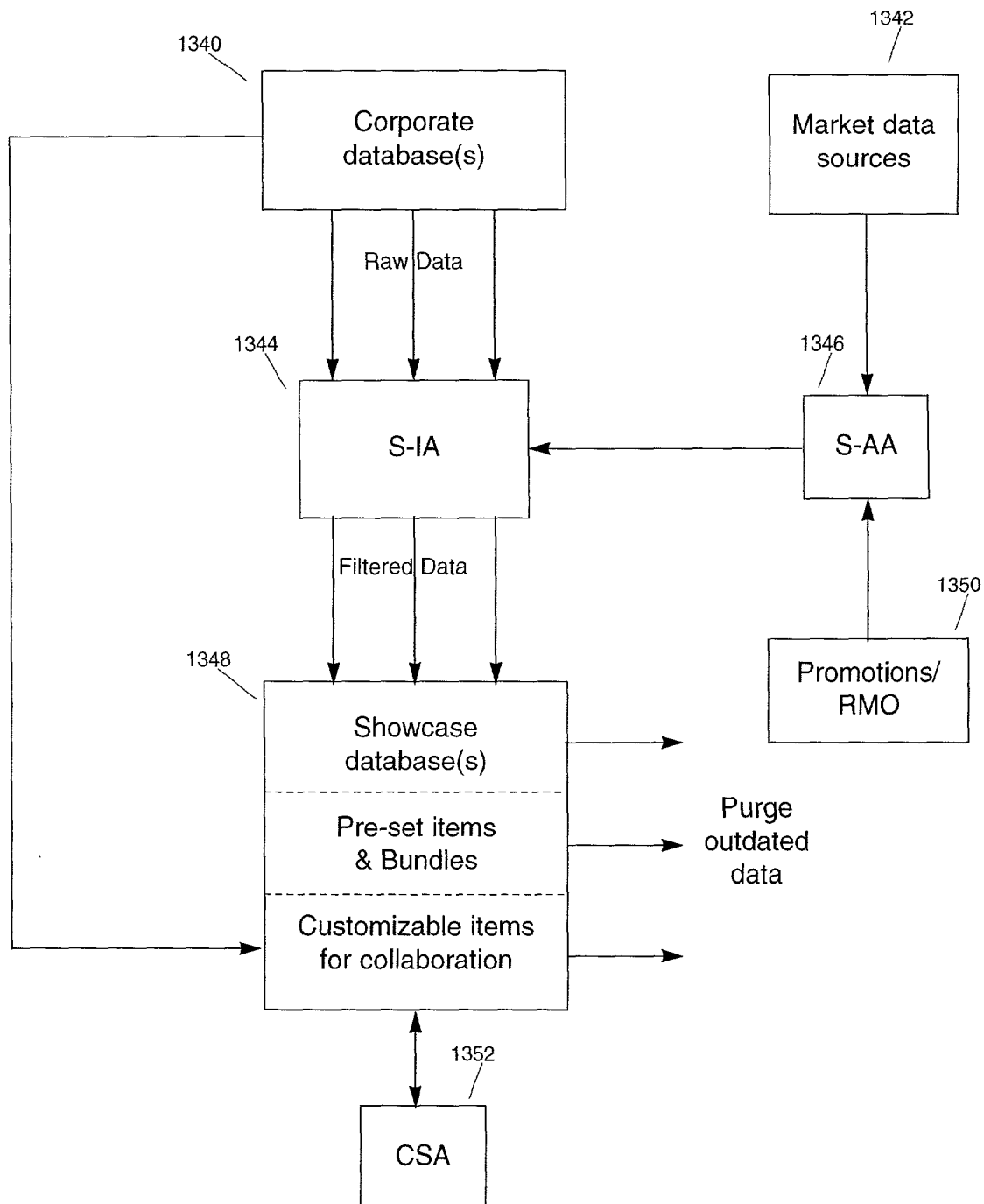


Fig. 7: Showcase Data Flow

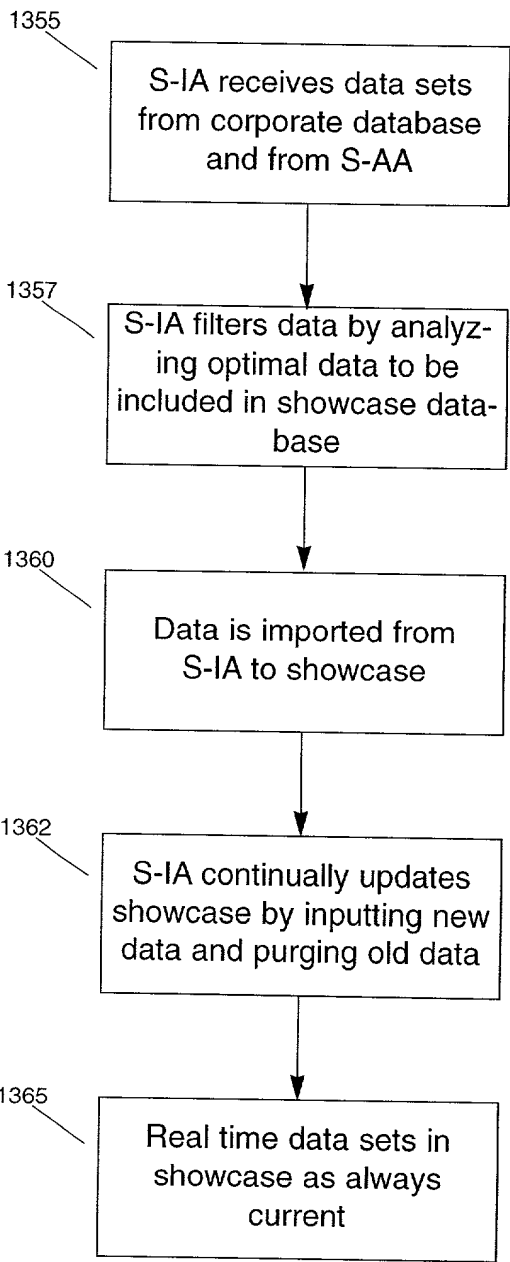


Fig. 8: Inter-agent System Architecture

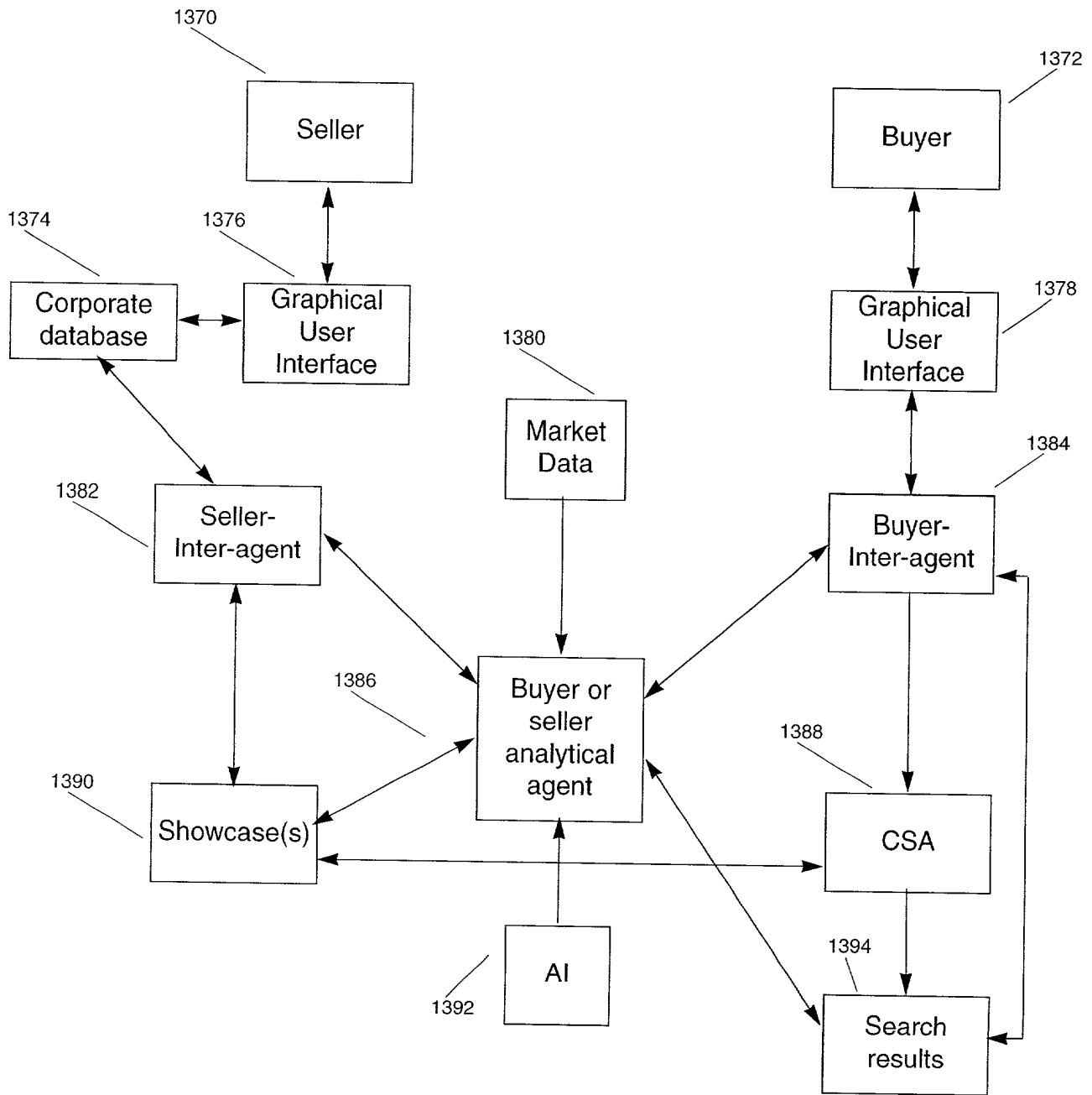


Fig. 9: Rivers of Data Flows

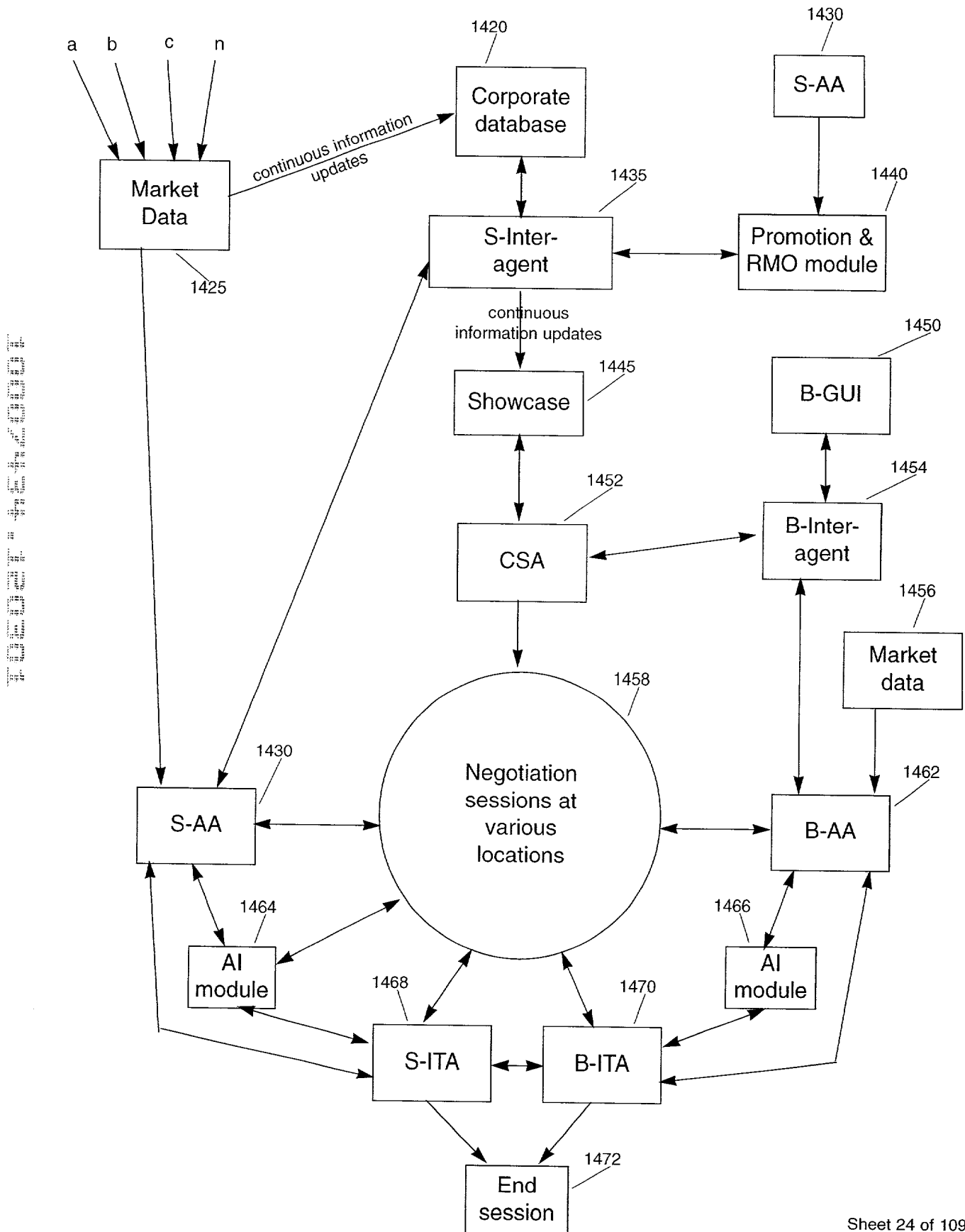


Fig. 10: CSA System Architecture

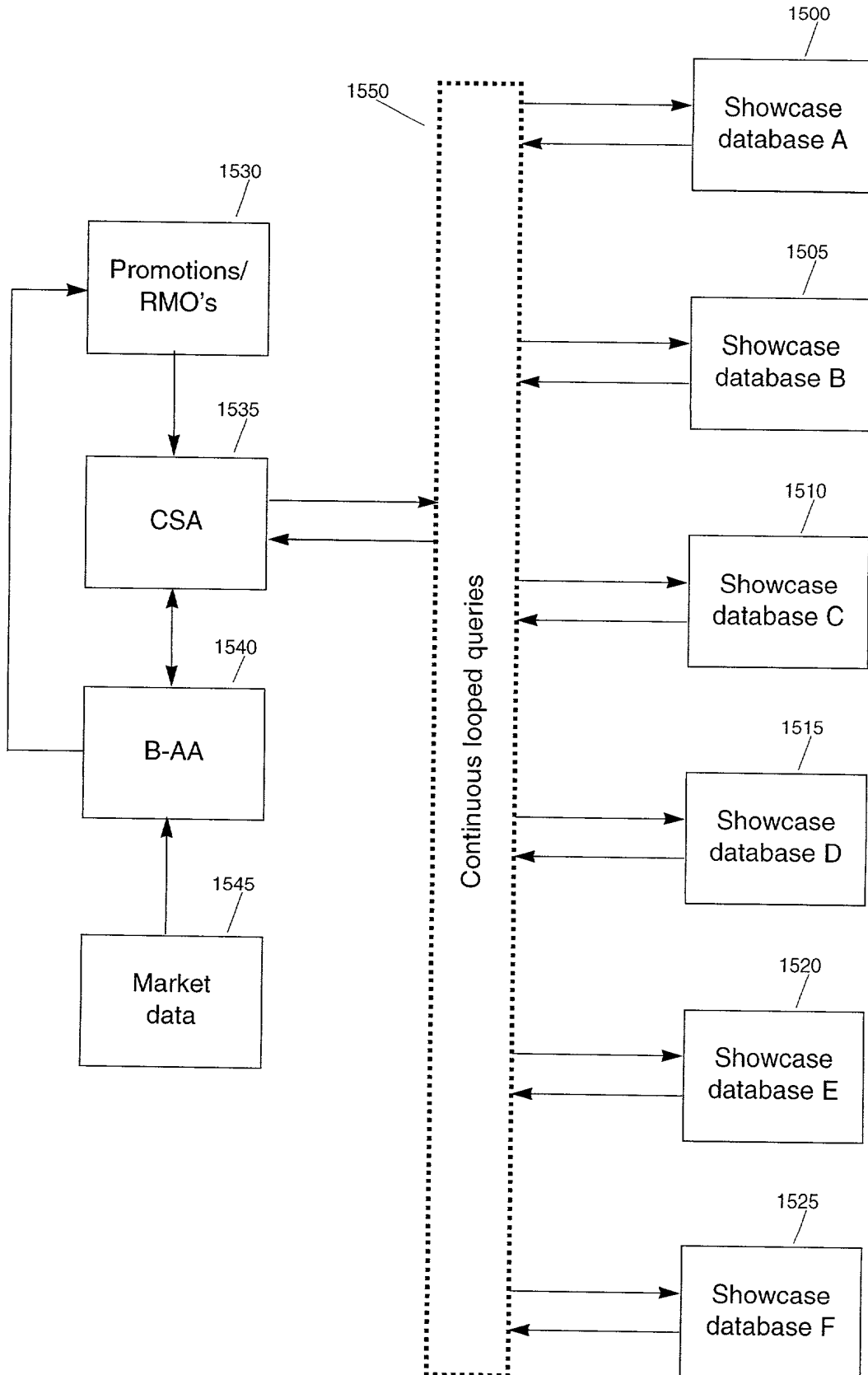


Fig. 11: CSA First Query Sequence

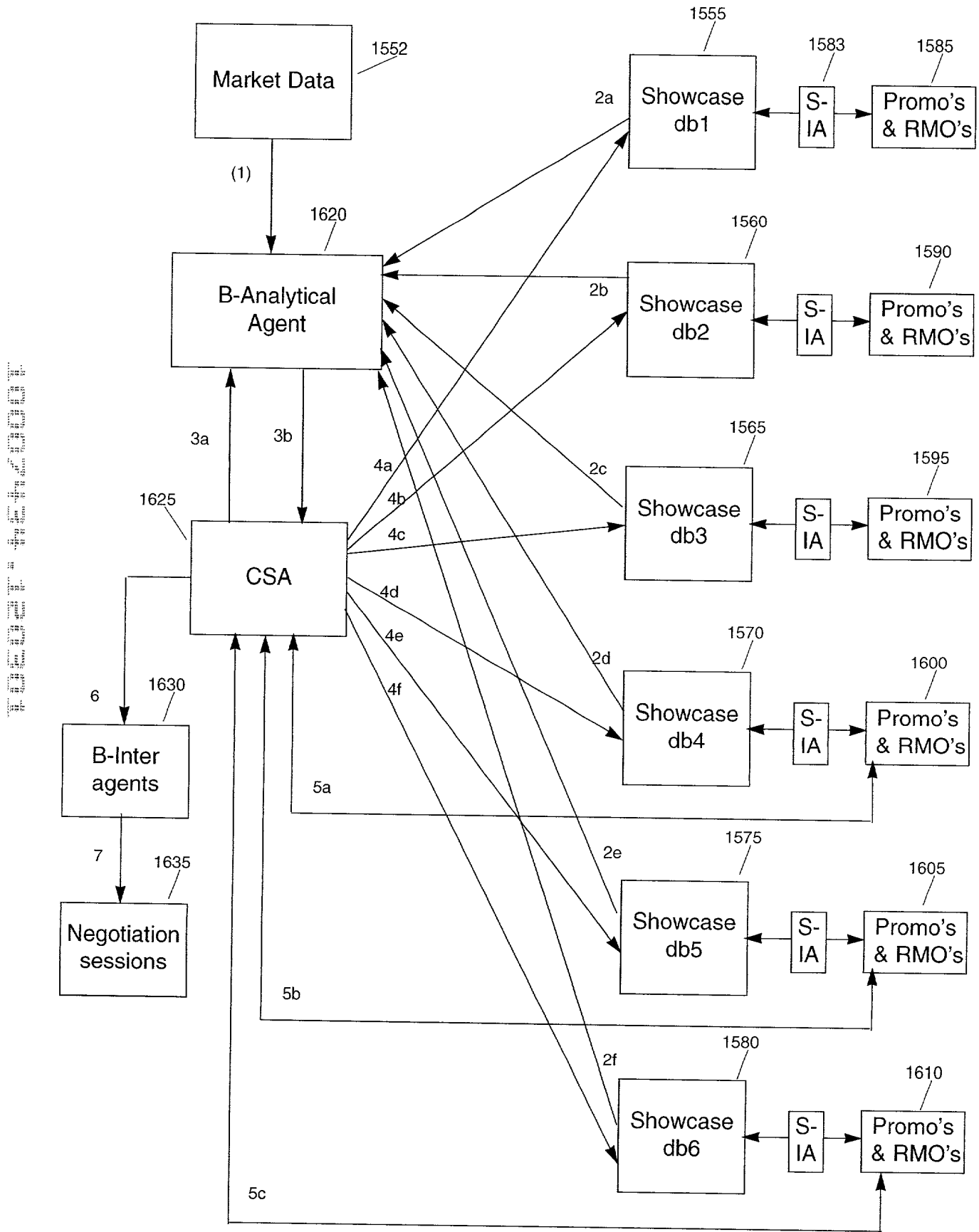


Fig. 12: Programmability of CSAs for Priorities of Search

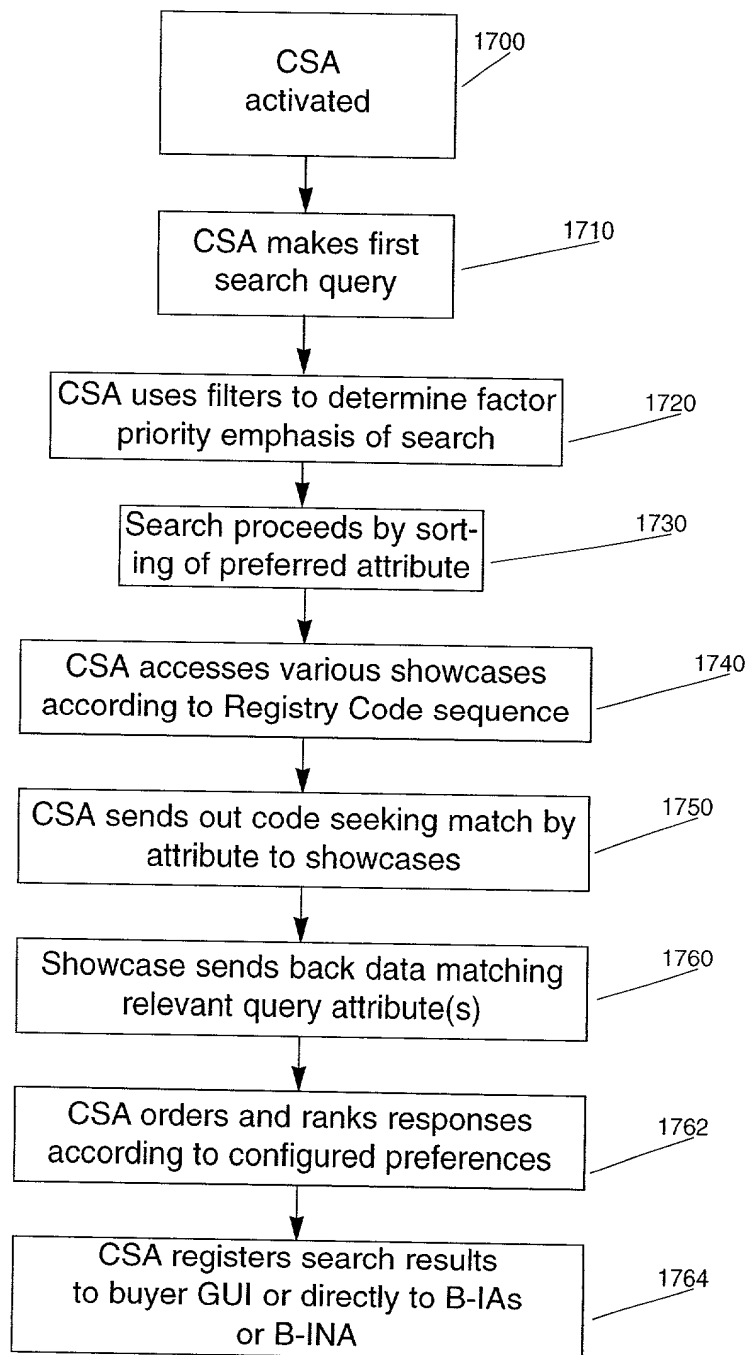


Fig. 13: CSA As Initial Search Query

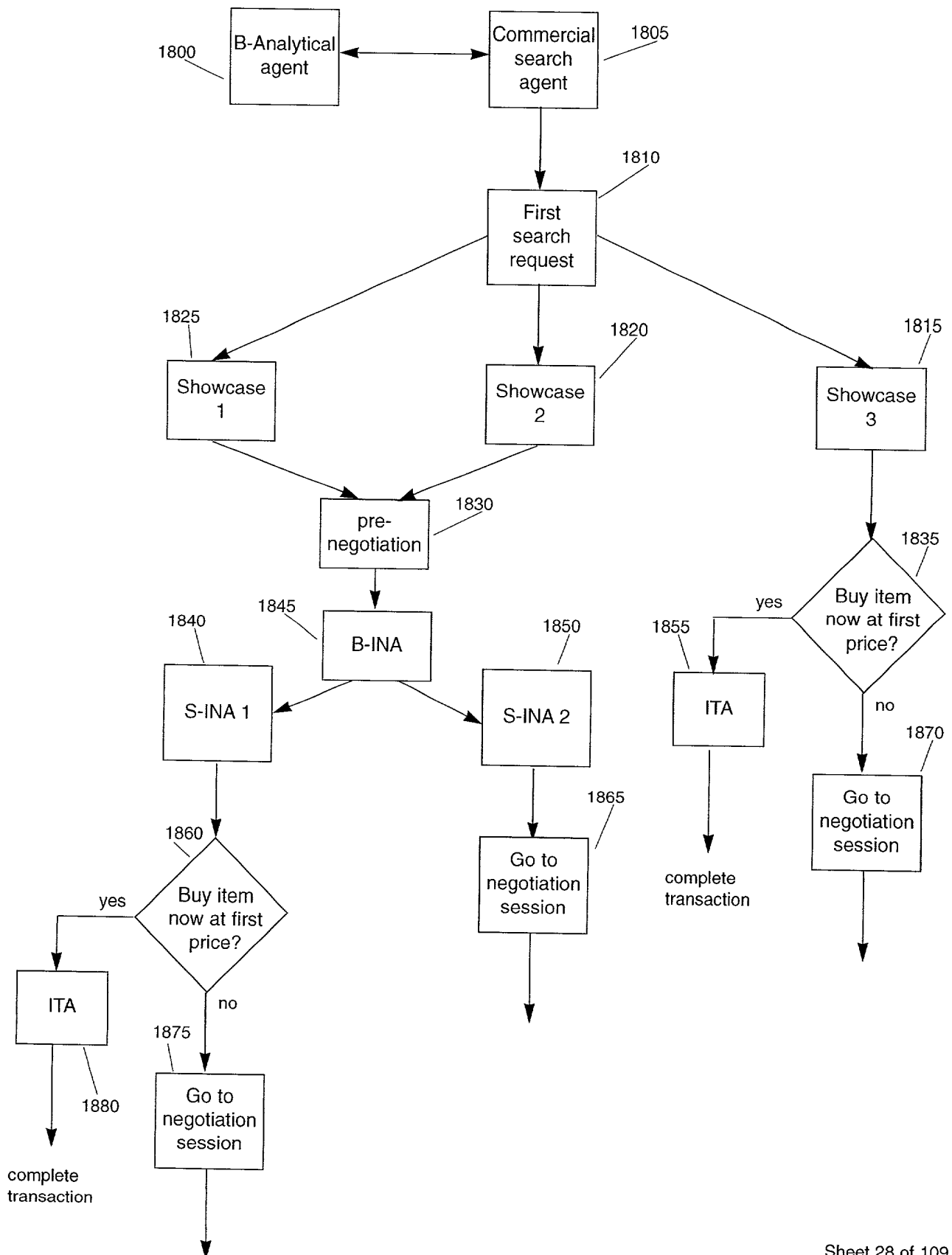


Fig. 14: CSA Filters

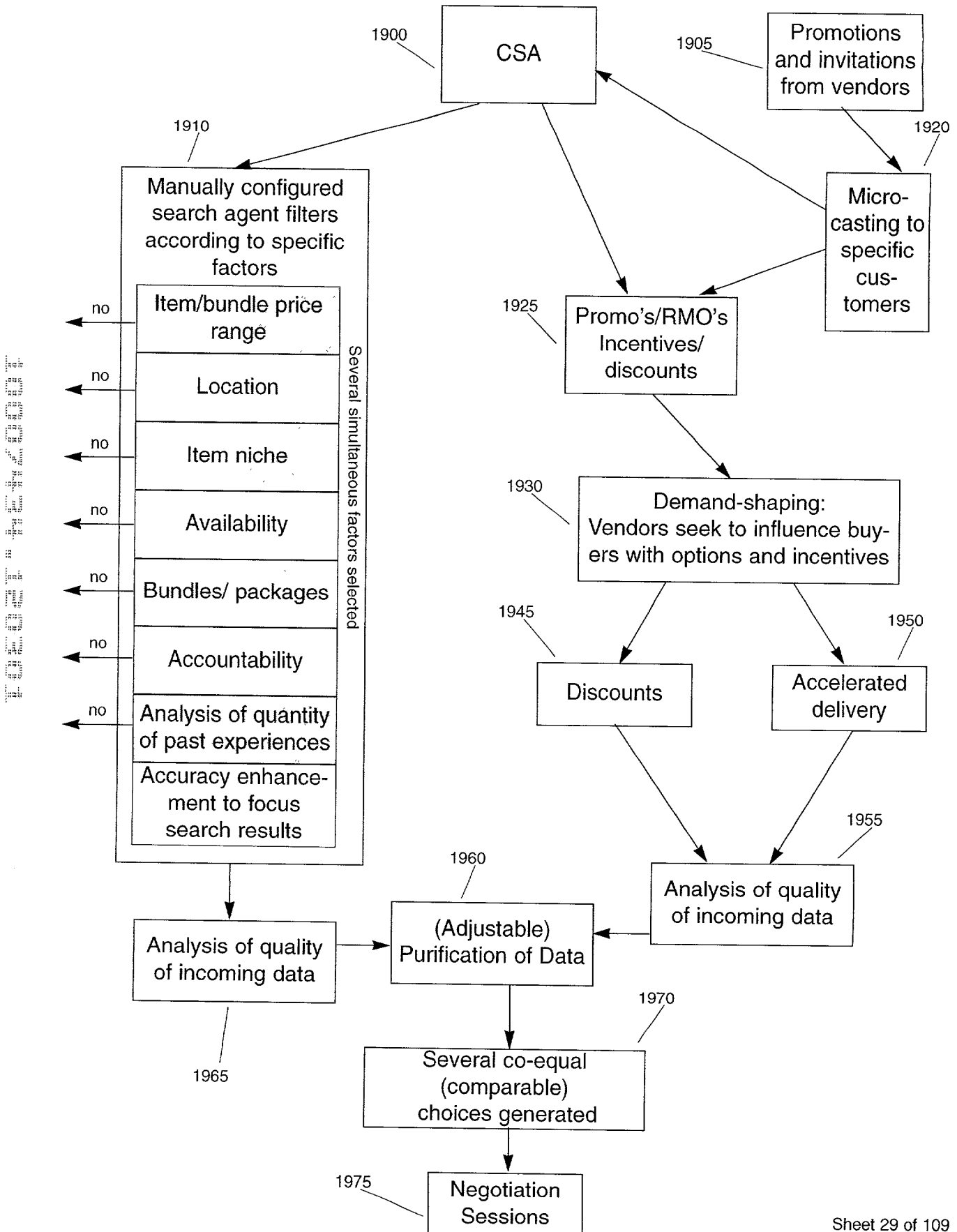


Fig. 15: Promotions

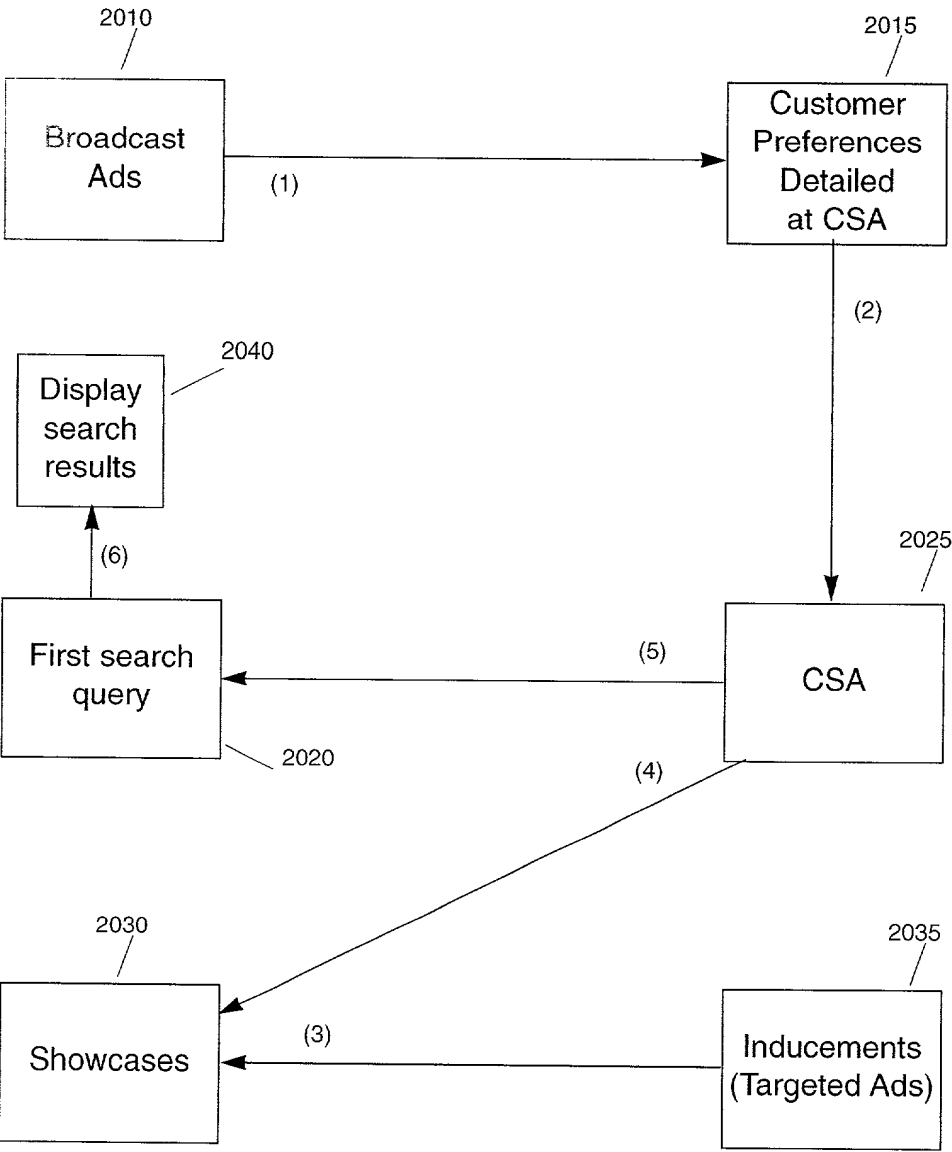


Fig. 16: Proximity Marketing For Mobile INAs

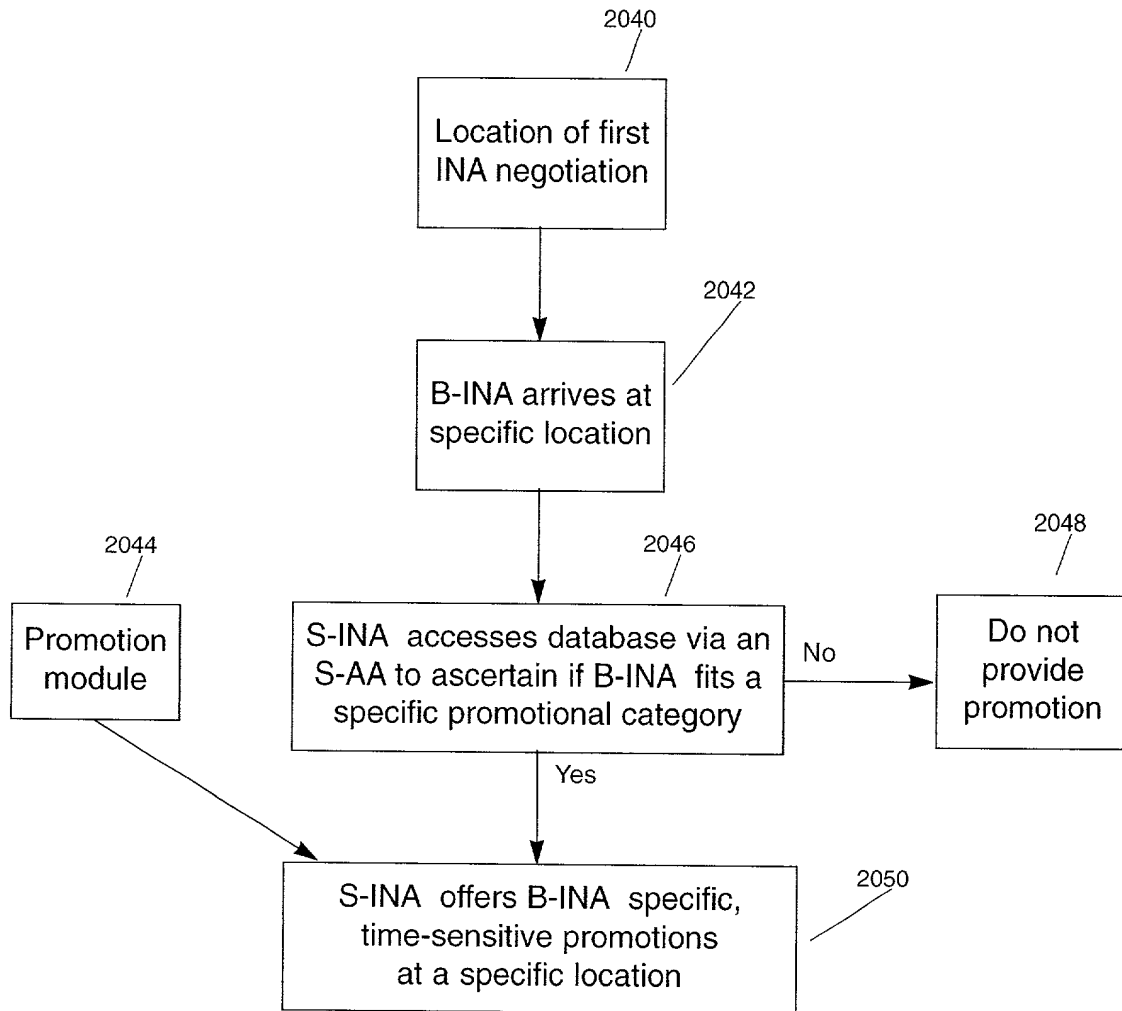


Fig. 17: Promotional Discounting

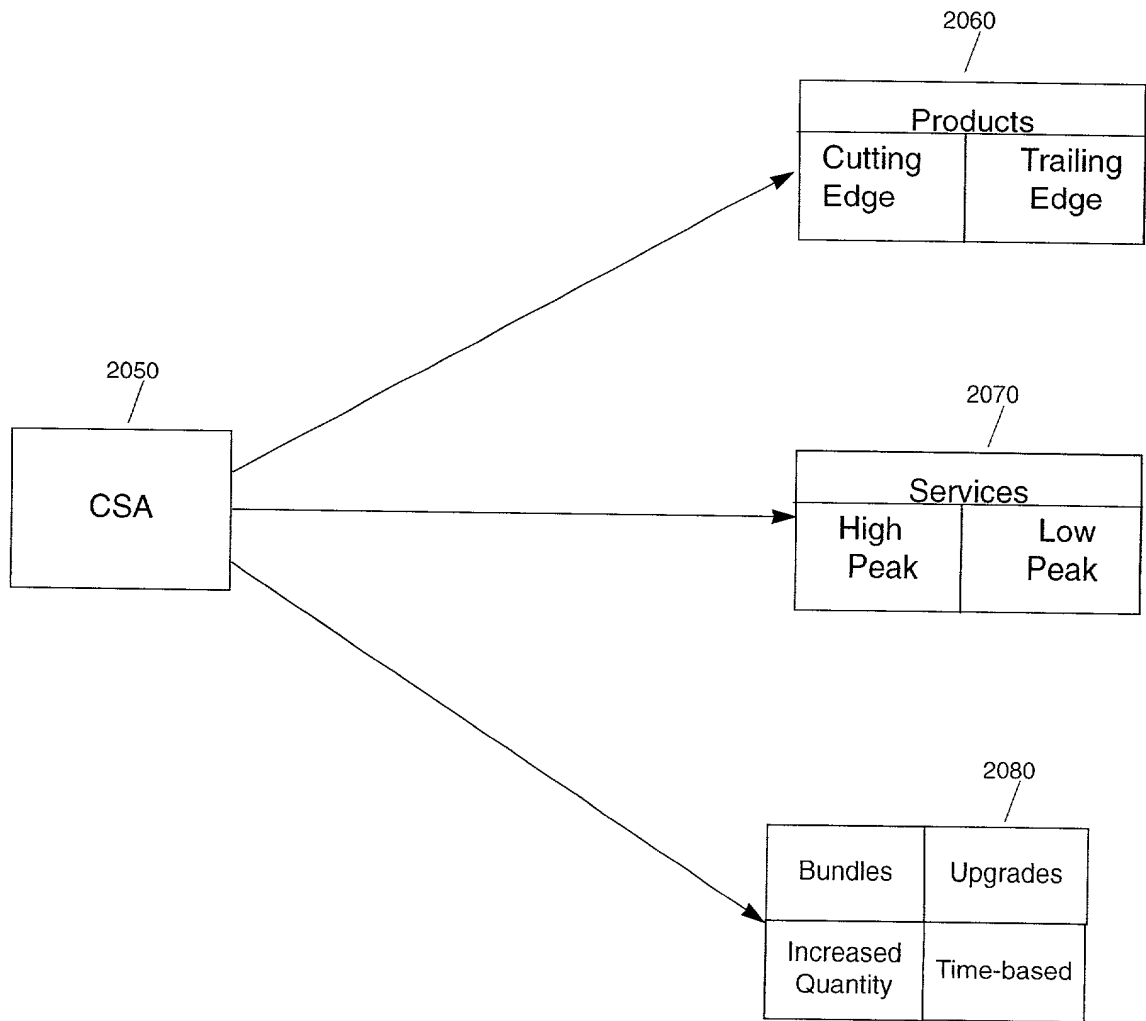


Fig. 18: Dynamic Pricing Model

Conditions:

- Product cycle rate
- Market/Economy
- Competition

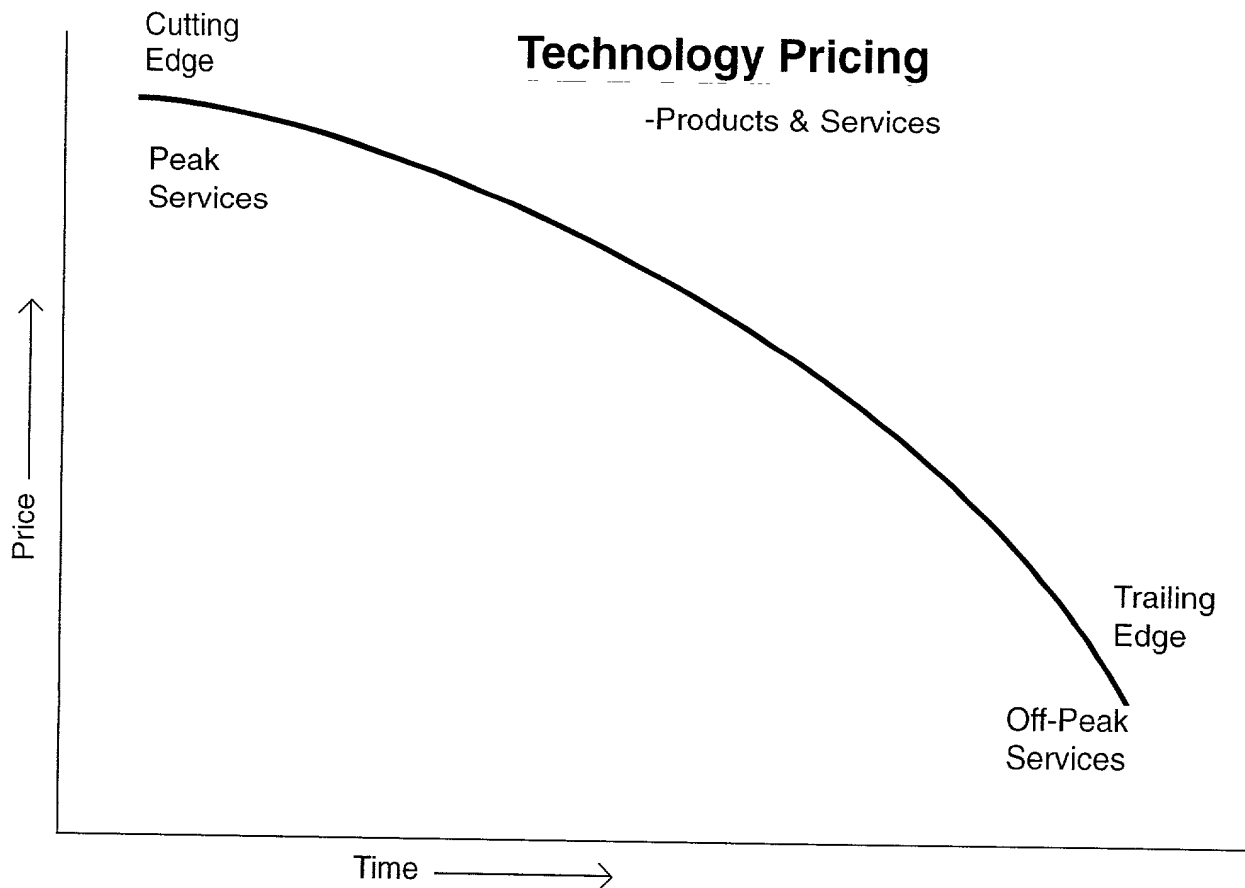


Fig. 19: Pricing Discount Promotions

Dropping Prices Tendency

1. Trailing edge technology
2. Off-peak service
3. Bundled packages (aggregation-discounts)
4. Surplus items
5. Decreasing quality
6. Quantity discount (multiple identical items)
8. Un-time-sensitive
9. Decreased features
10. Exploding (Time-sensitive) offers

Figure 19: Pricing Discount Promotions. The figure is a list of 10 items, numbered 1 through 10, representing different pricing discount promotions. The items are: 1. Trailing edge technology, 2. Off-peak service, 3. Bundled packages (aggregation-discounts), 4. Surplus items, 5. Decreasing quality, 6. Quantity discount (multiple identical items), 8. Un-time-sensitive, 9. Decreased features, and 10. Exploding (Time-sensitive) offers. The list is presented in a vertical column on the left side of the page.

Fig. 20: Promotions Integrated with CSA & Showcase

Transaction based vs. Relationship based

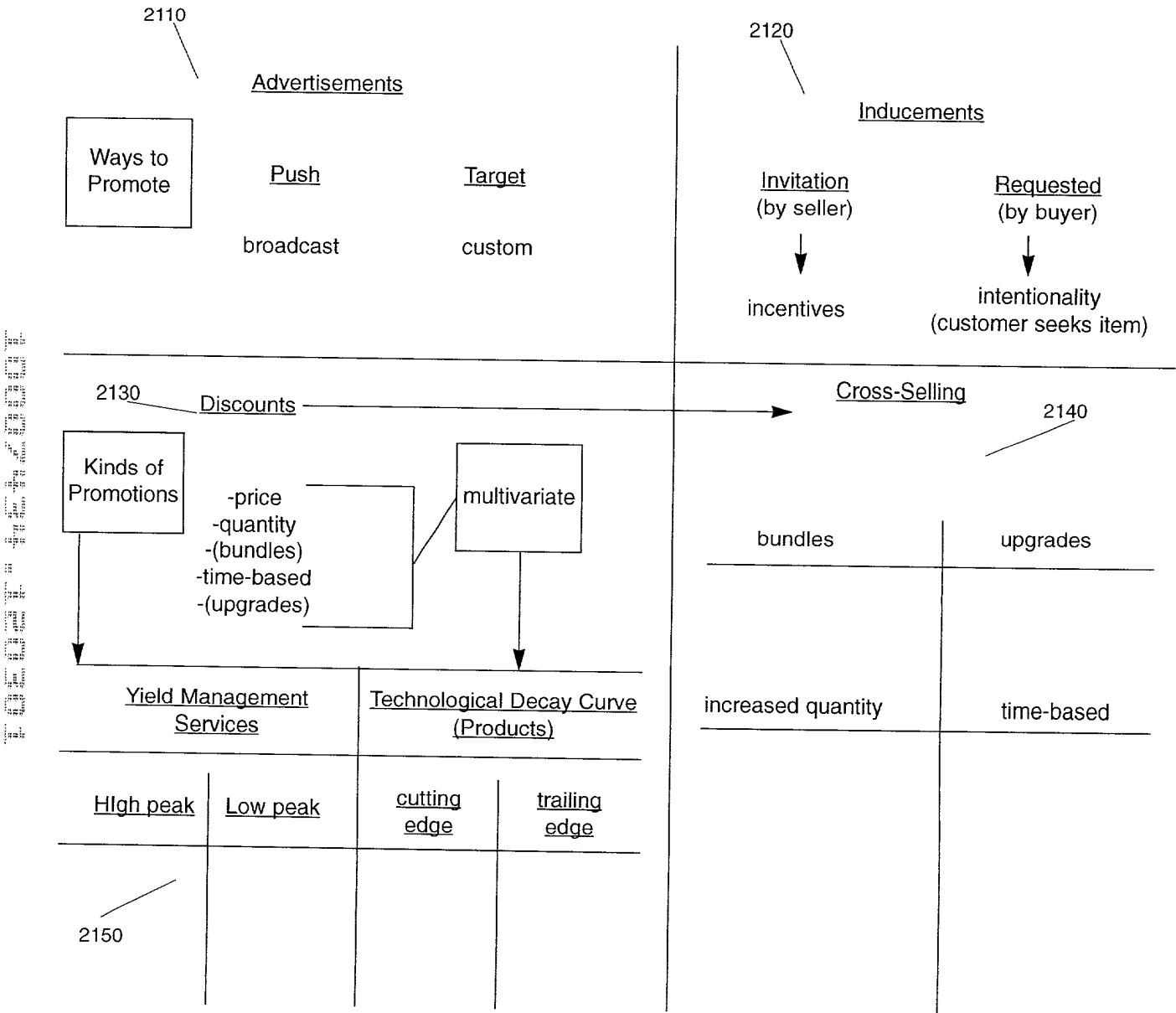


Fig. 21: RMO Contract Processes in Distributed System

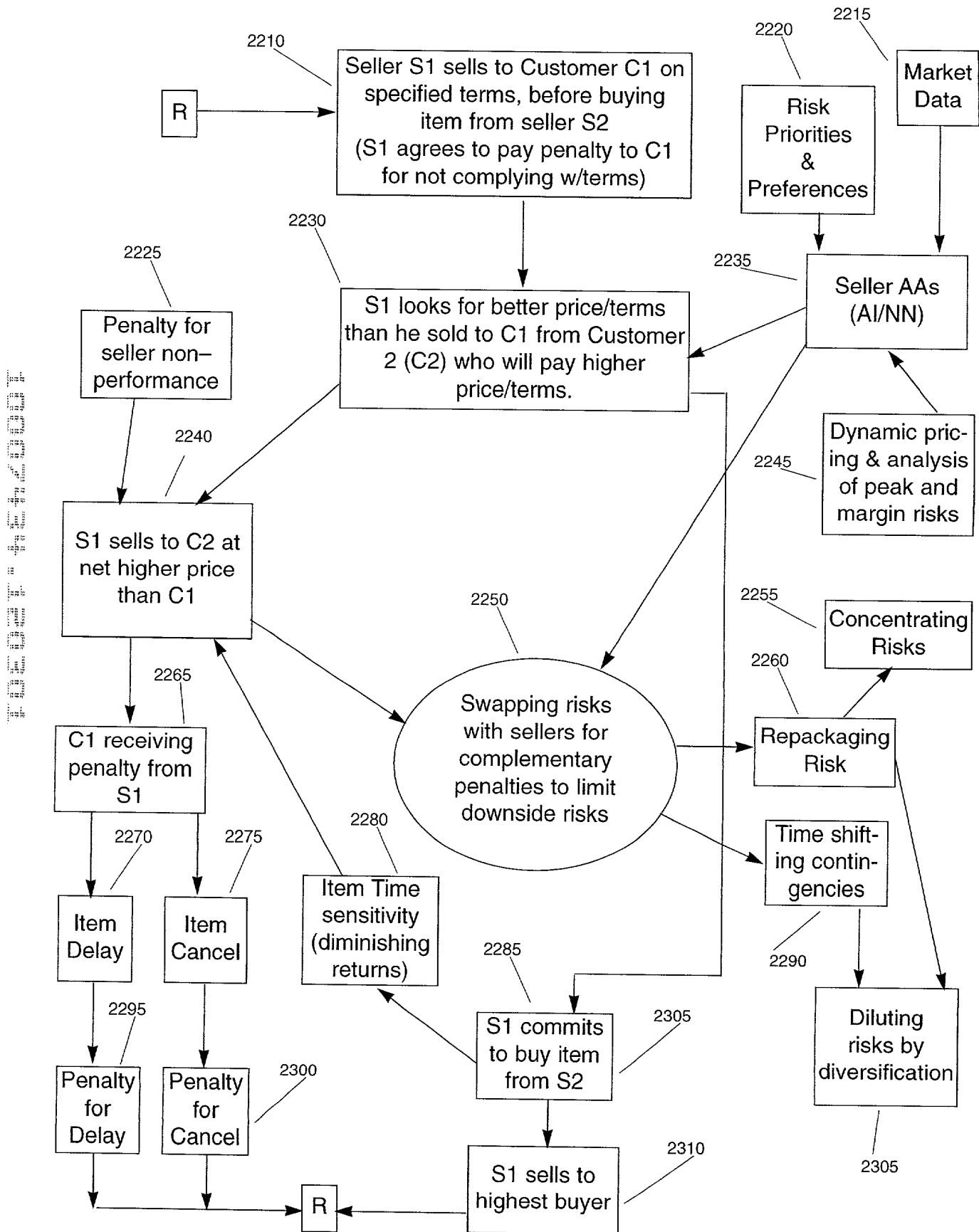


Fig. 22: Transaction Contingencies

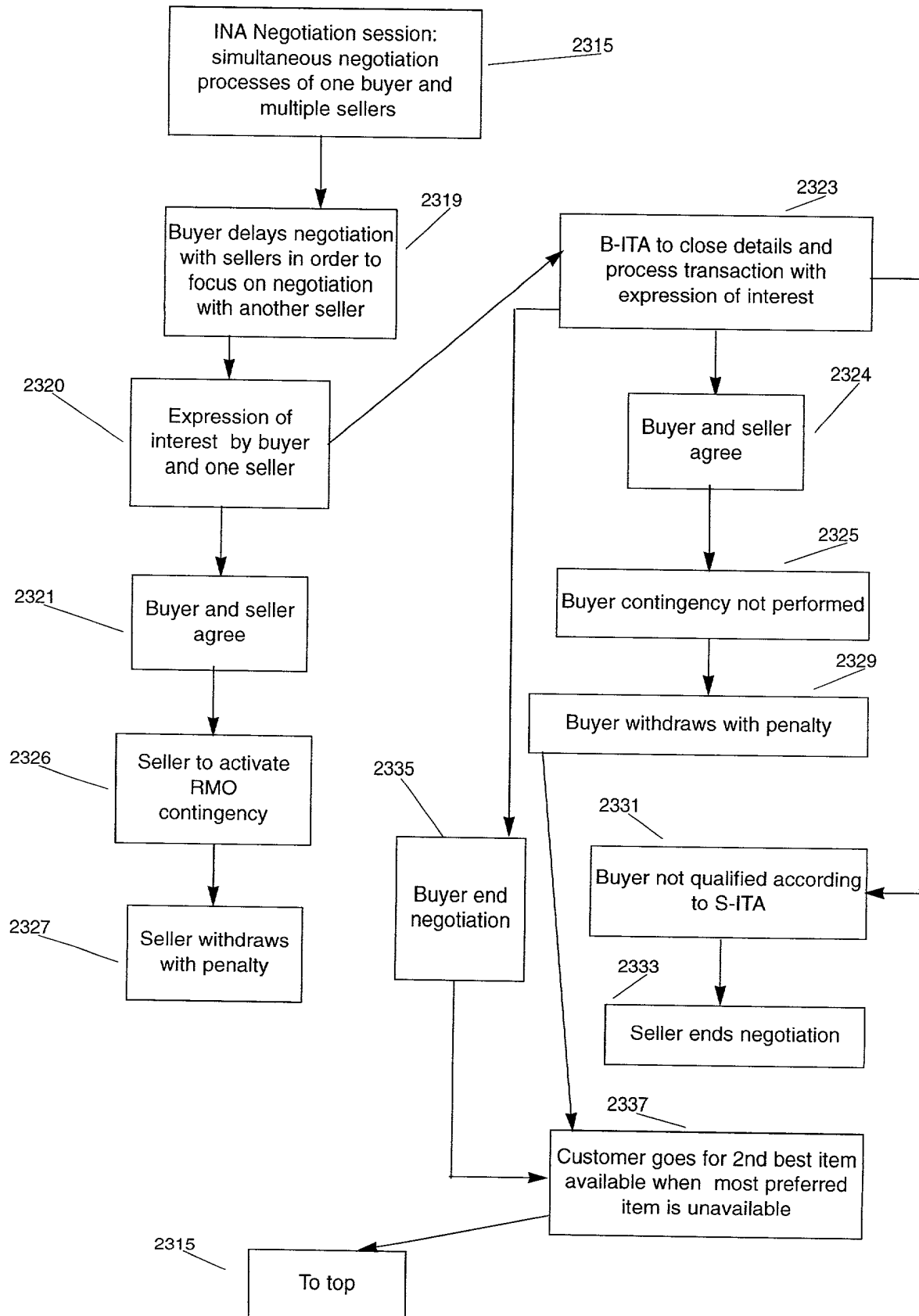


Fig. 23: Information Collaboration for MTO

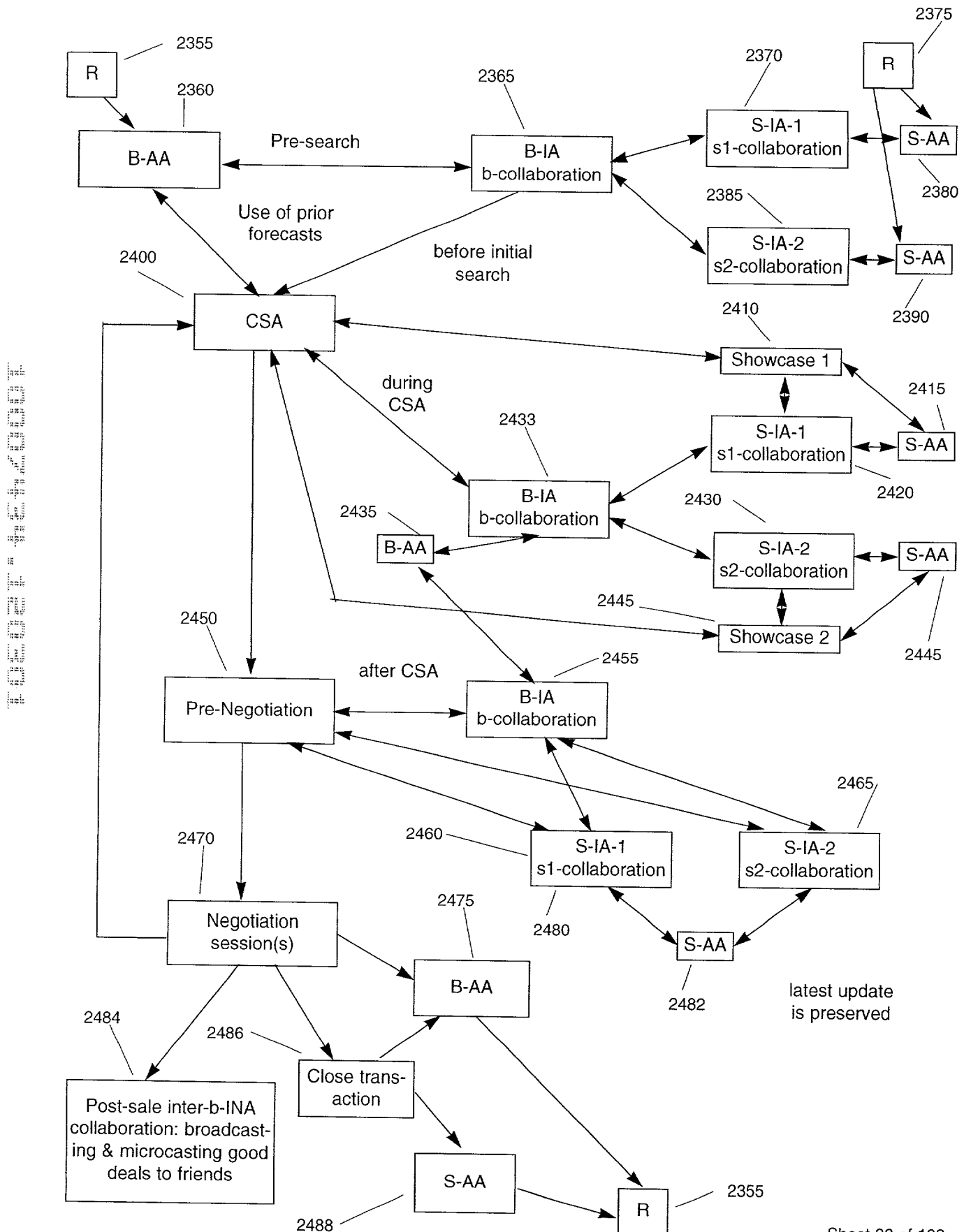


Fig. 24: Collaboration Process For MTO Customization

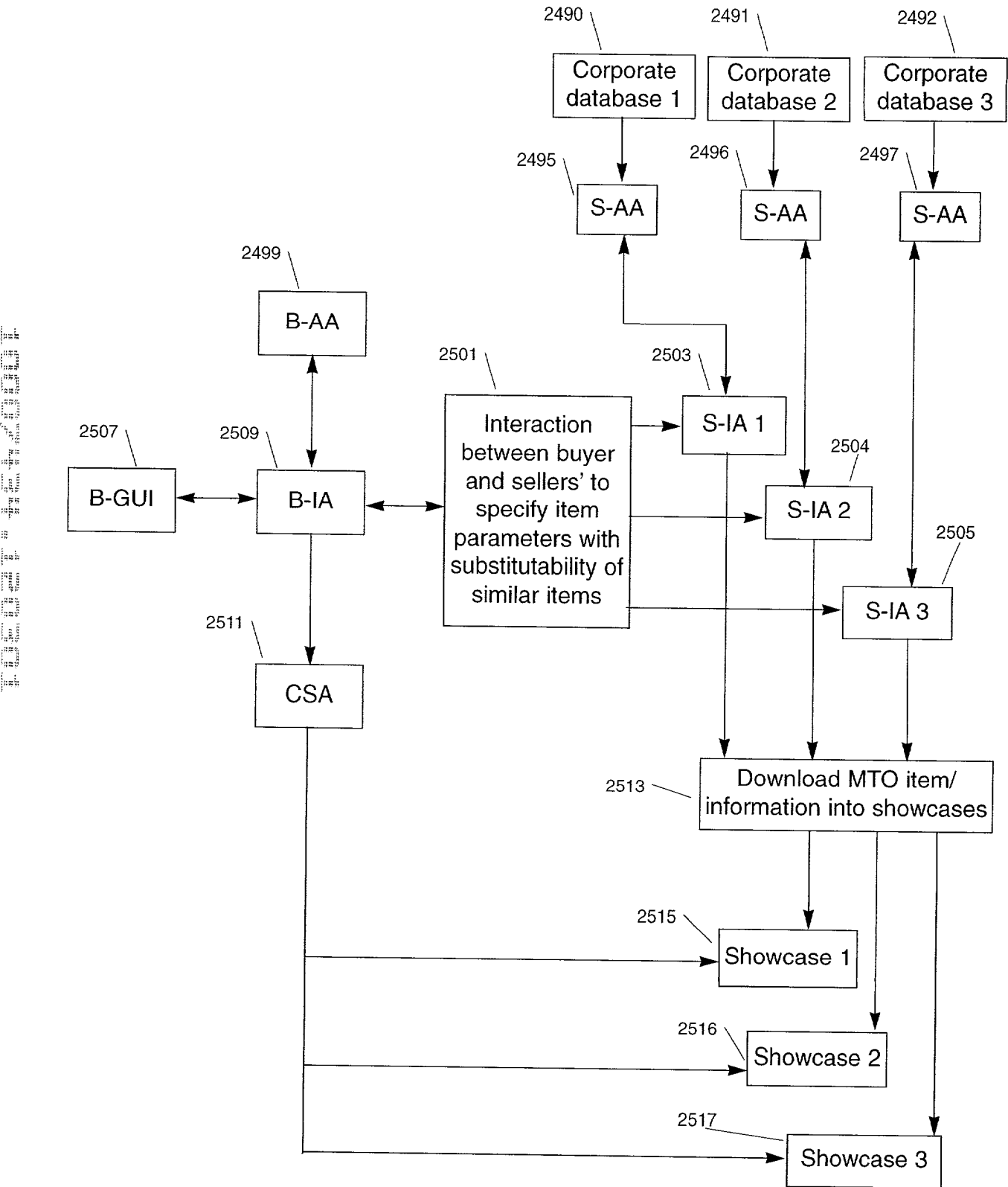


Fig. 25: INA Interaction (B-INA & S-INA Interactions)

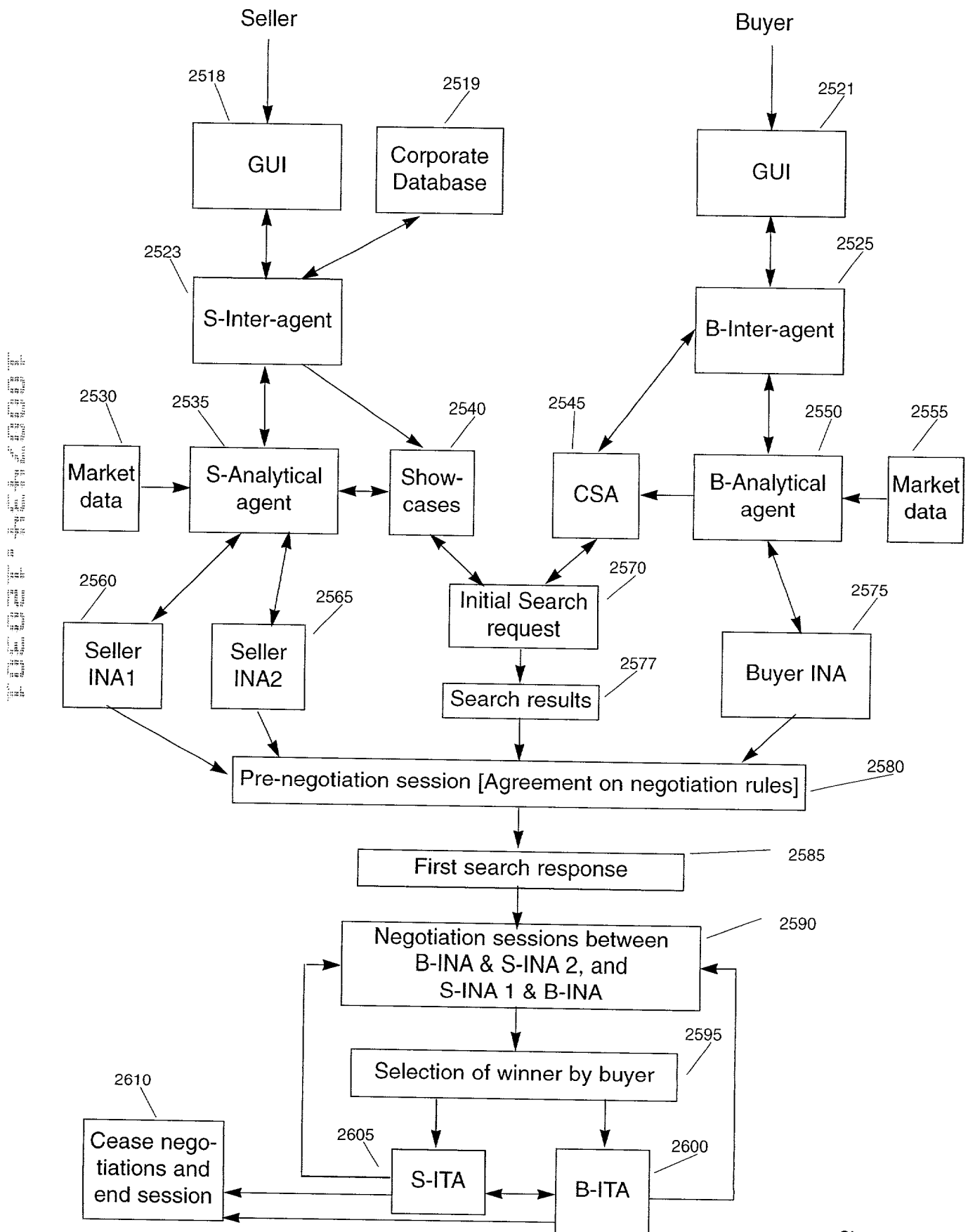


Fig. 26: INA Interactions - Ricochet Model

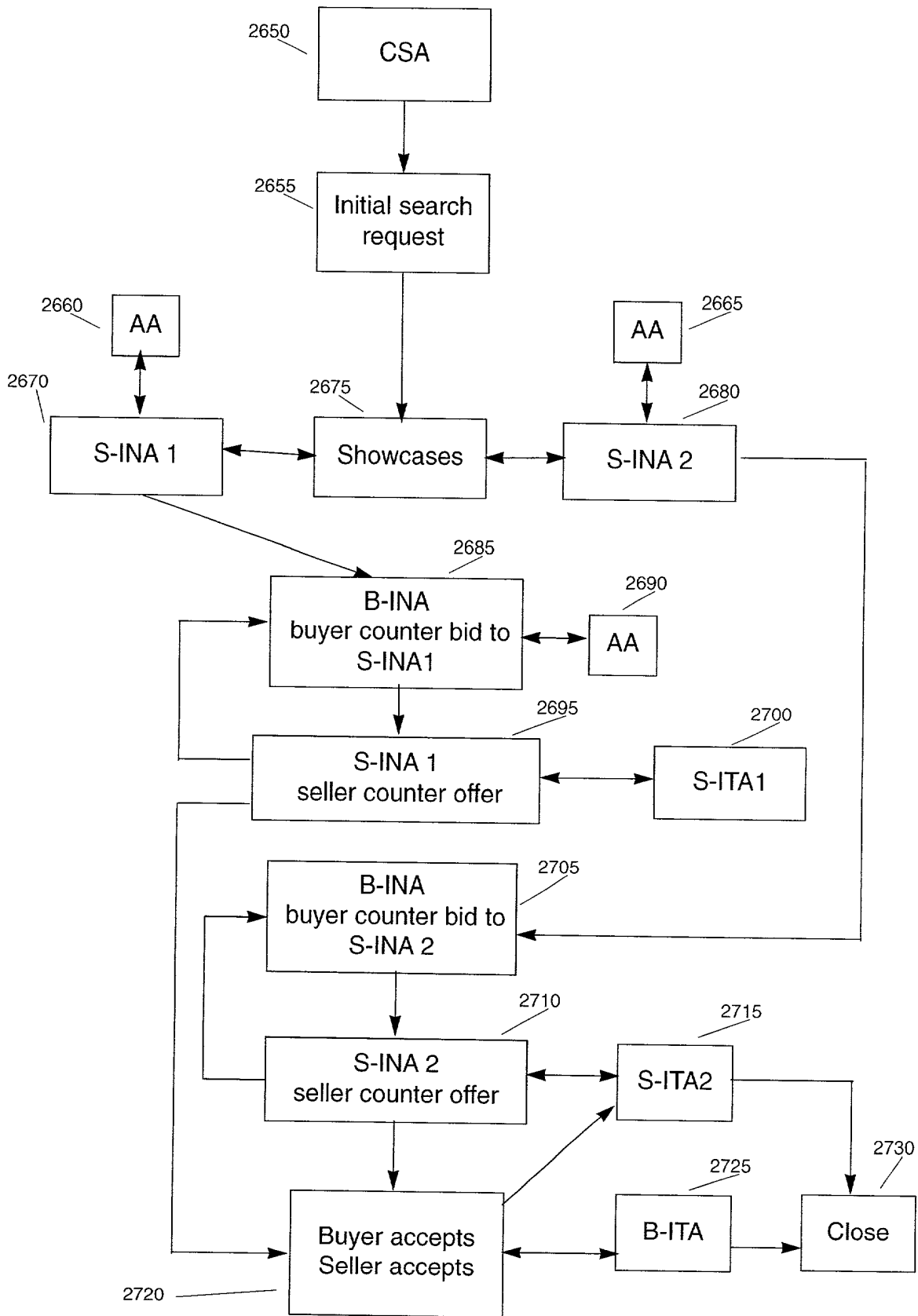


Fig. 27: Pre-Negotiation

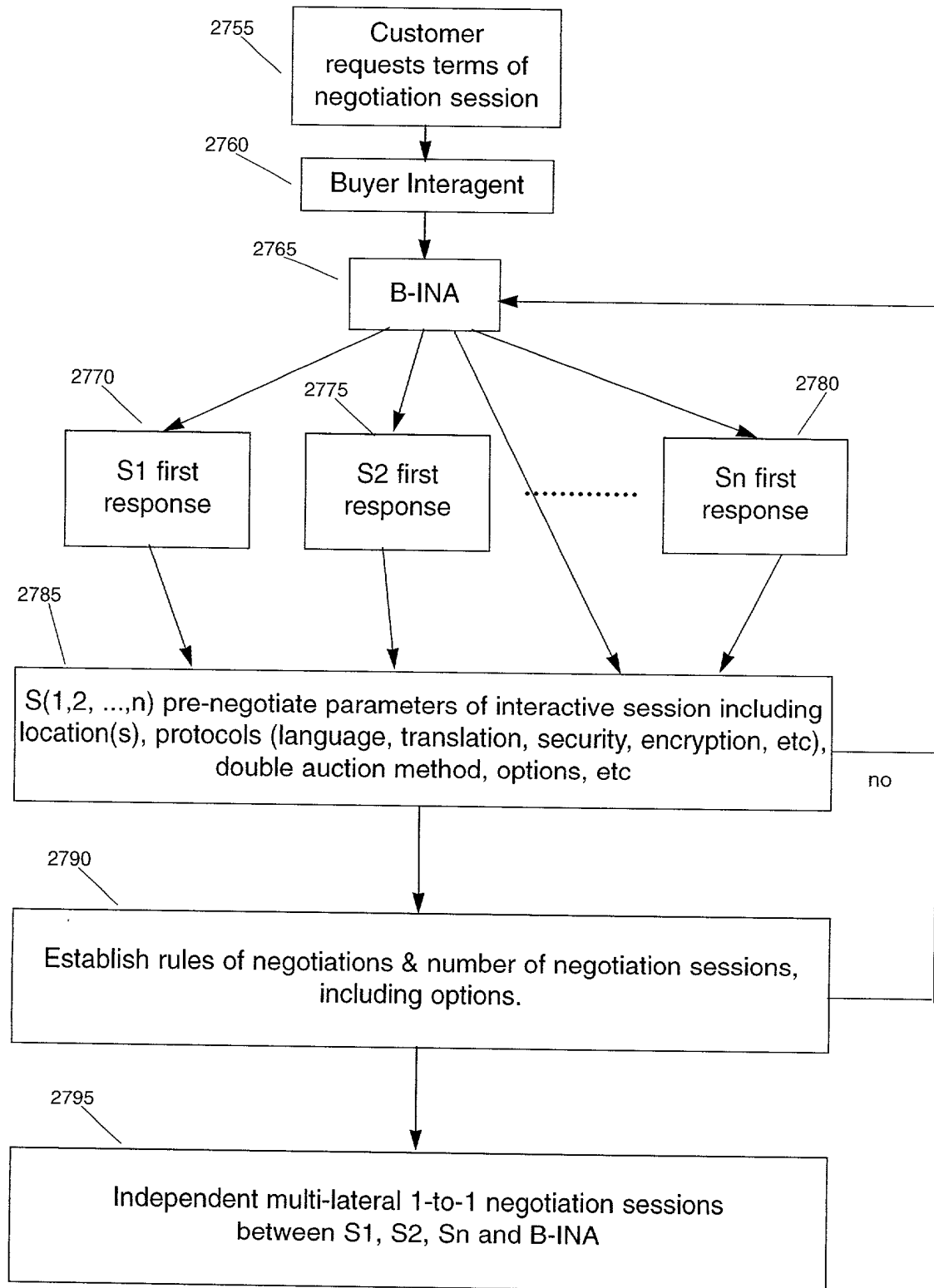


Fig. 28: Time-Based Negotiation Strategy Concealment

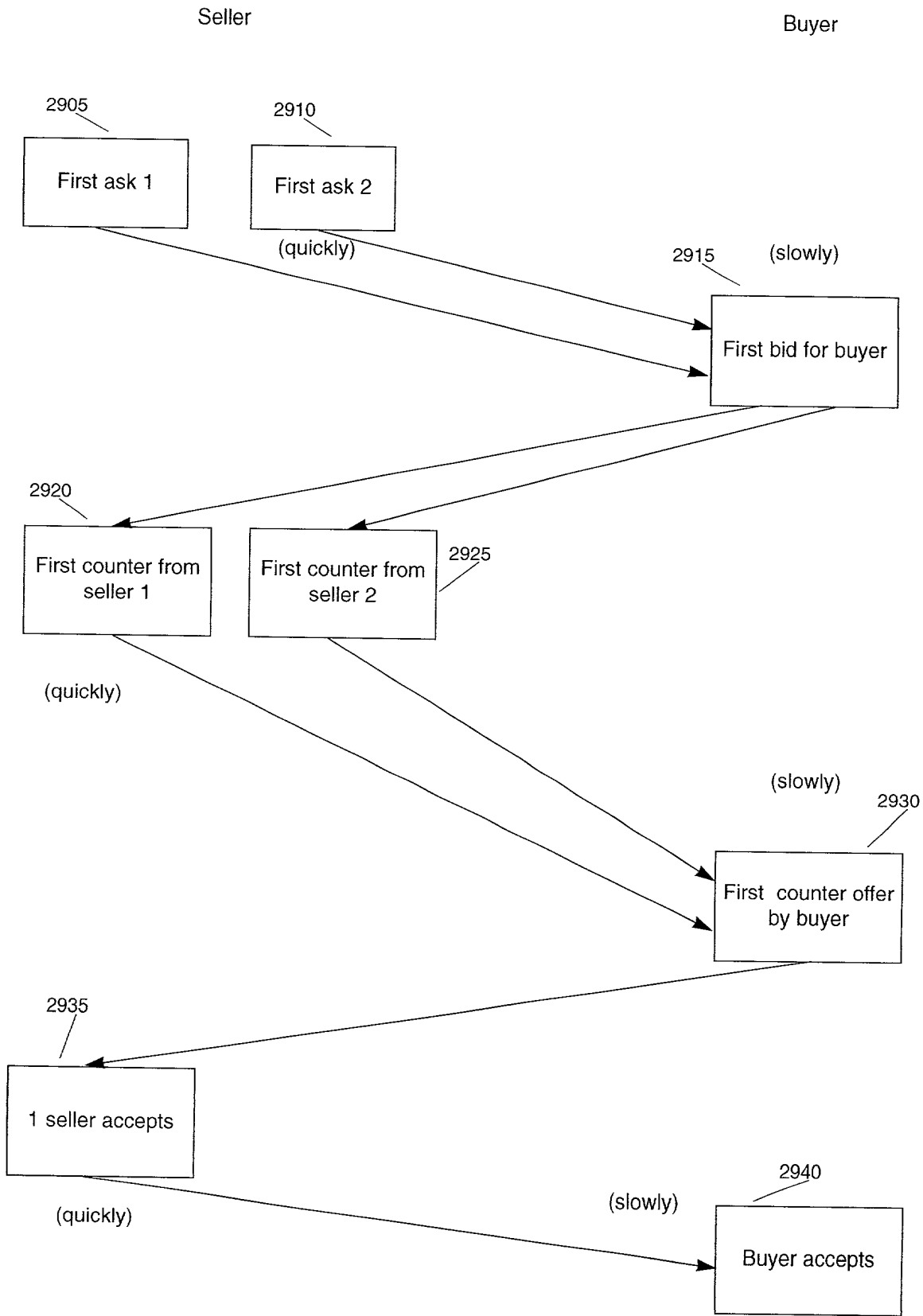


Fig. 29: INA Logistics

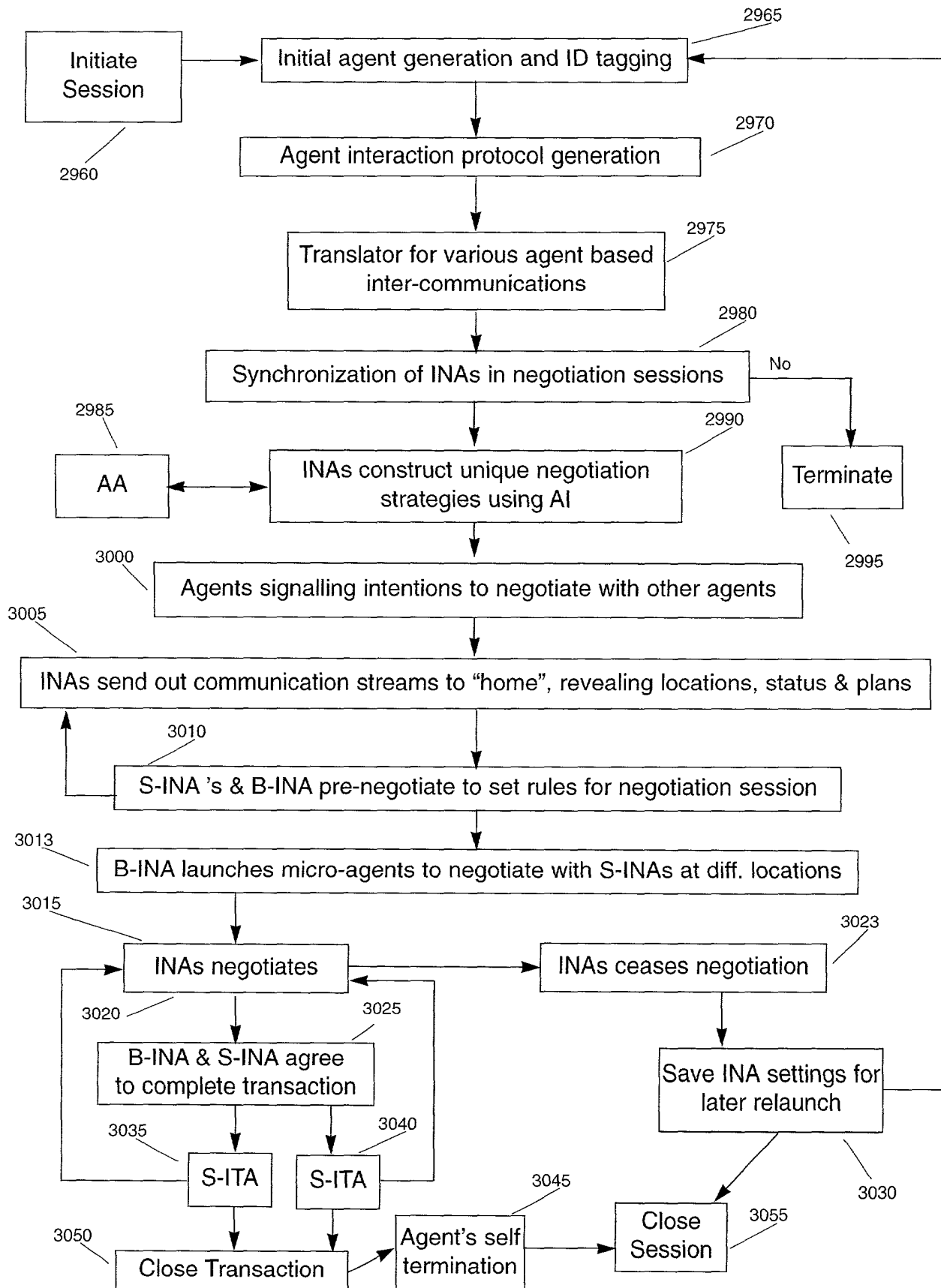


Fig. 30: INA Interaction Sequence #1

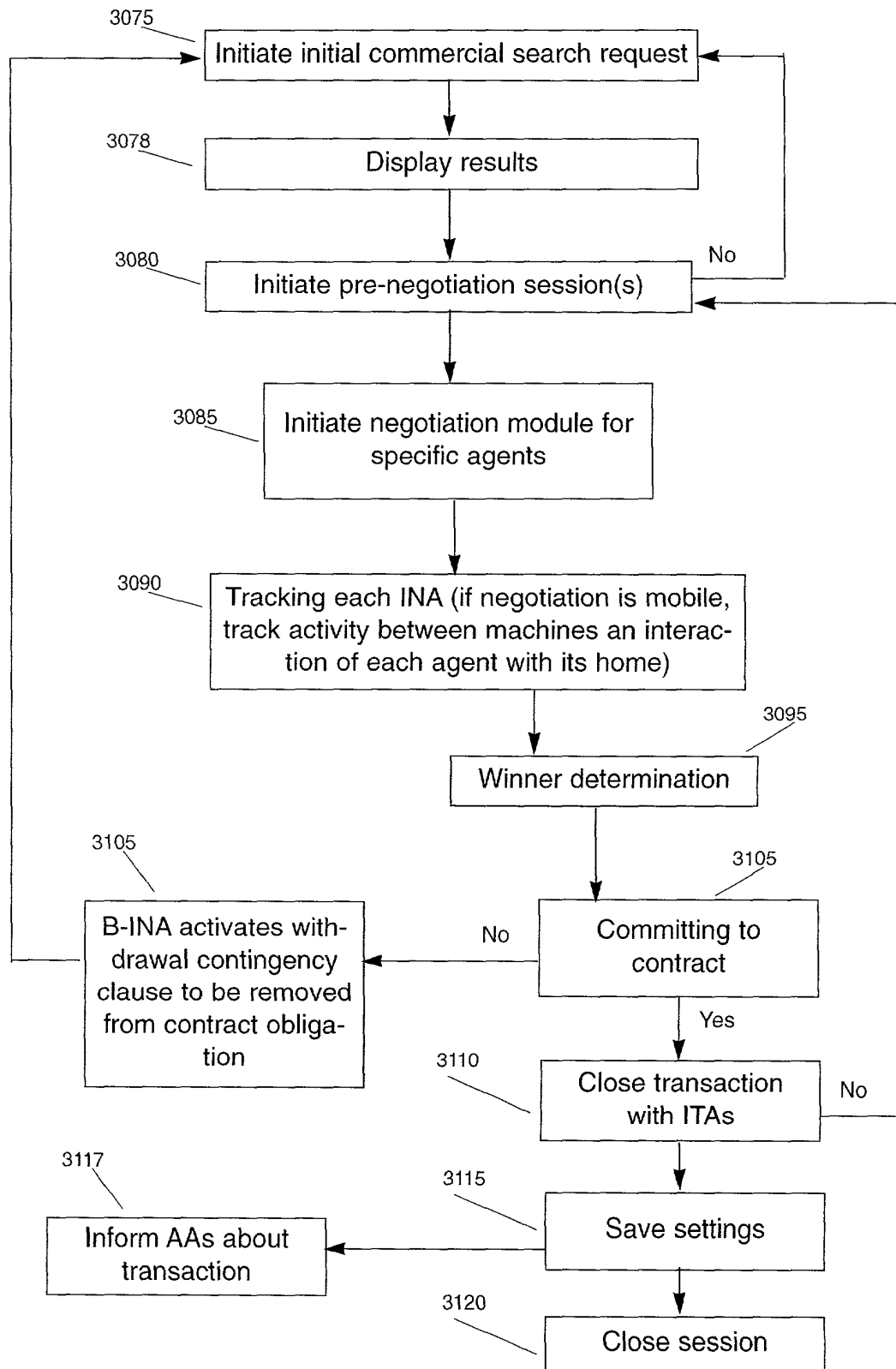


Fig. 31: INA Interaction Sequence #2

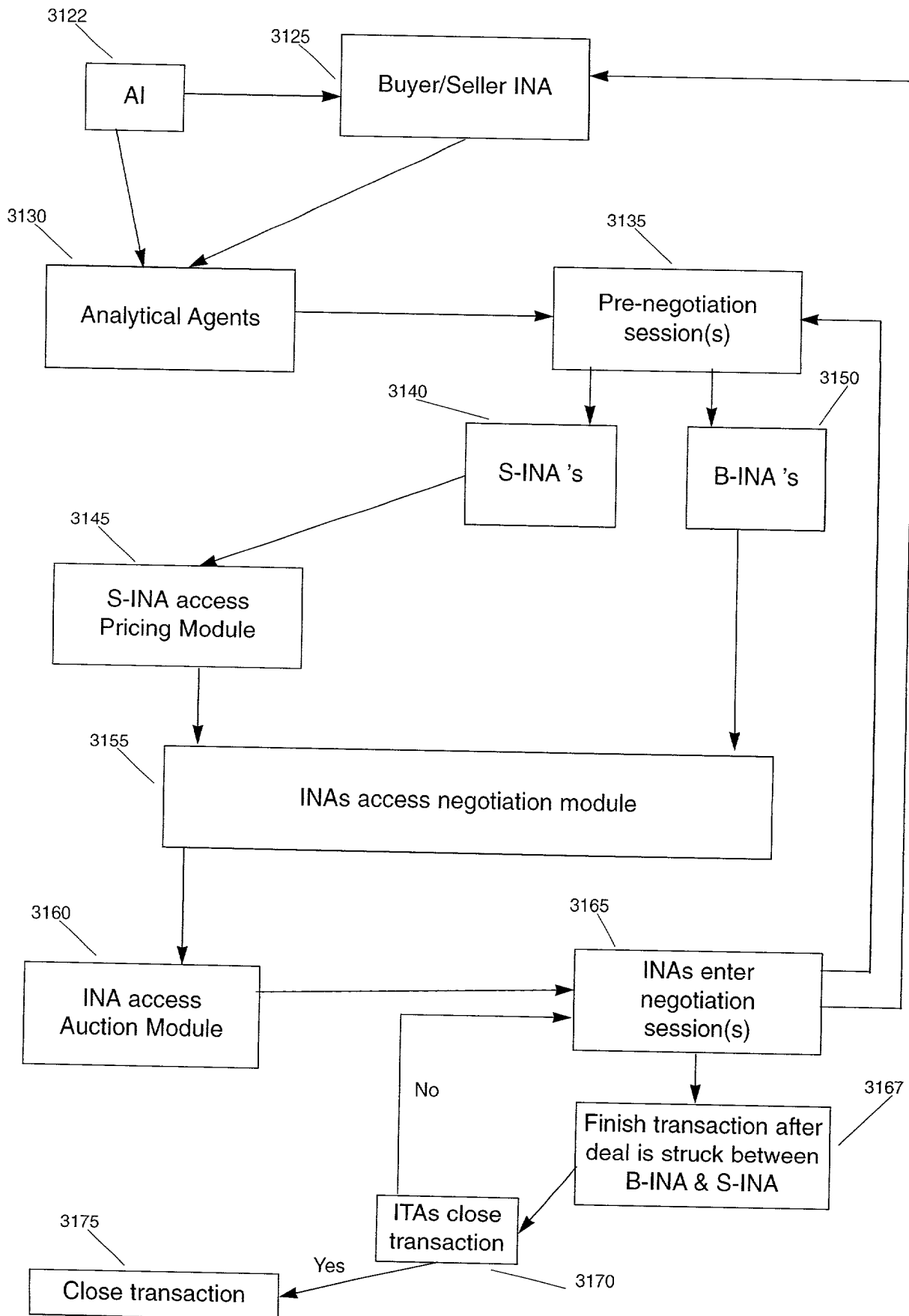


Fig. 32: INA Architecture 1 (First part interactions)

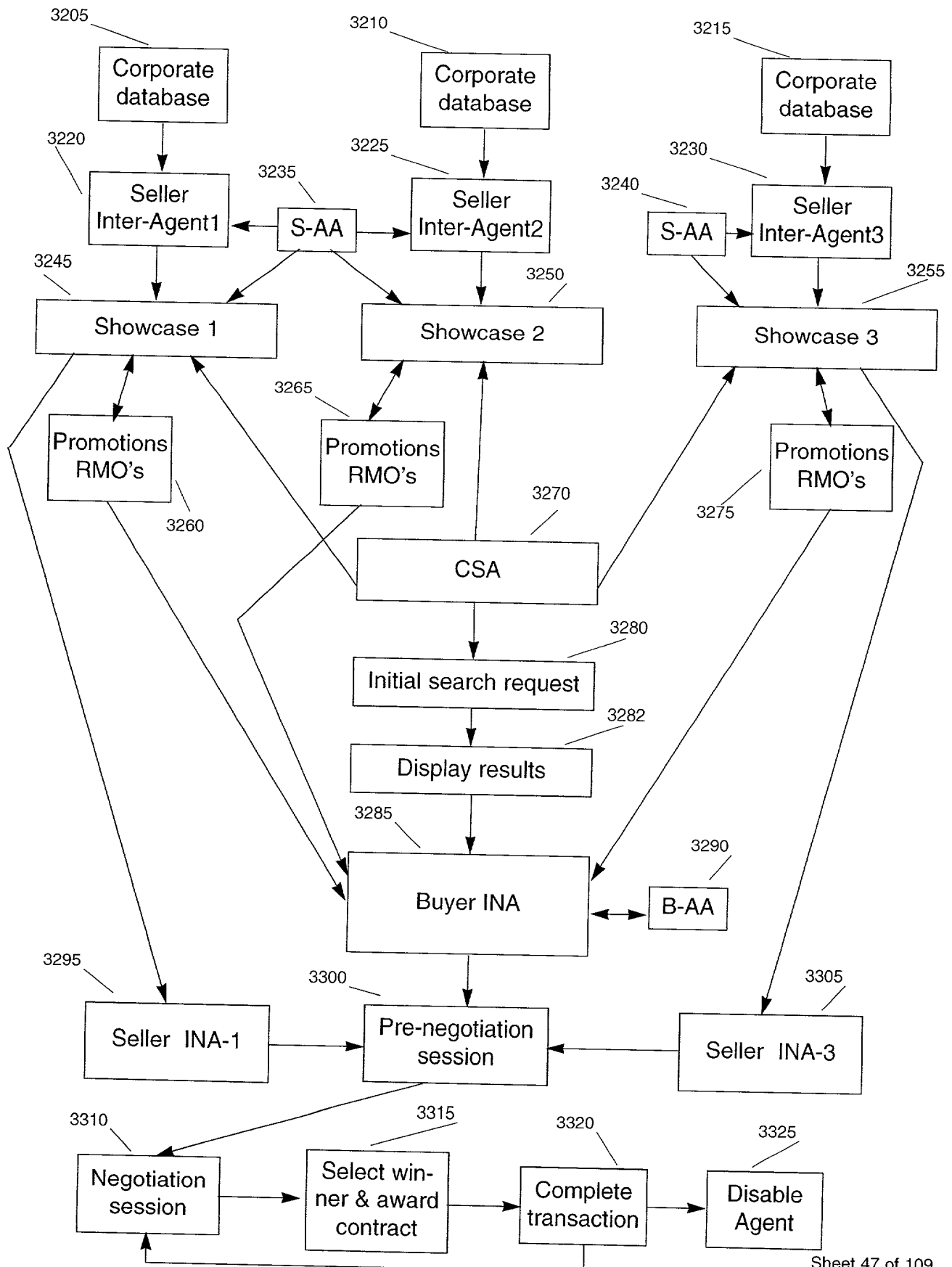


Fig. 33: INA Architecture 2 (Negotiation interactions)

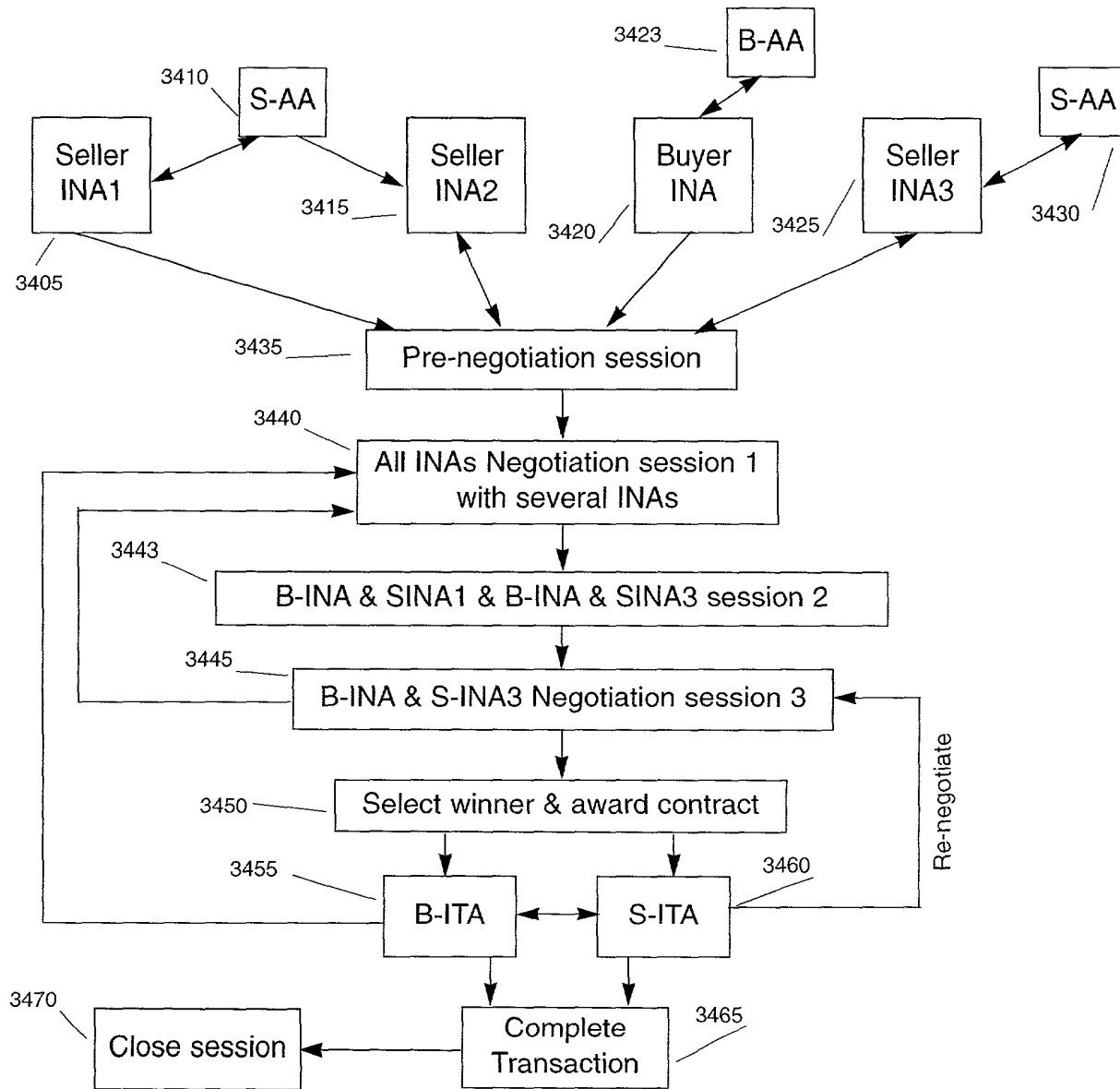


Fig. 34: INANegotiation Time Based Sequences

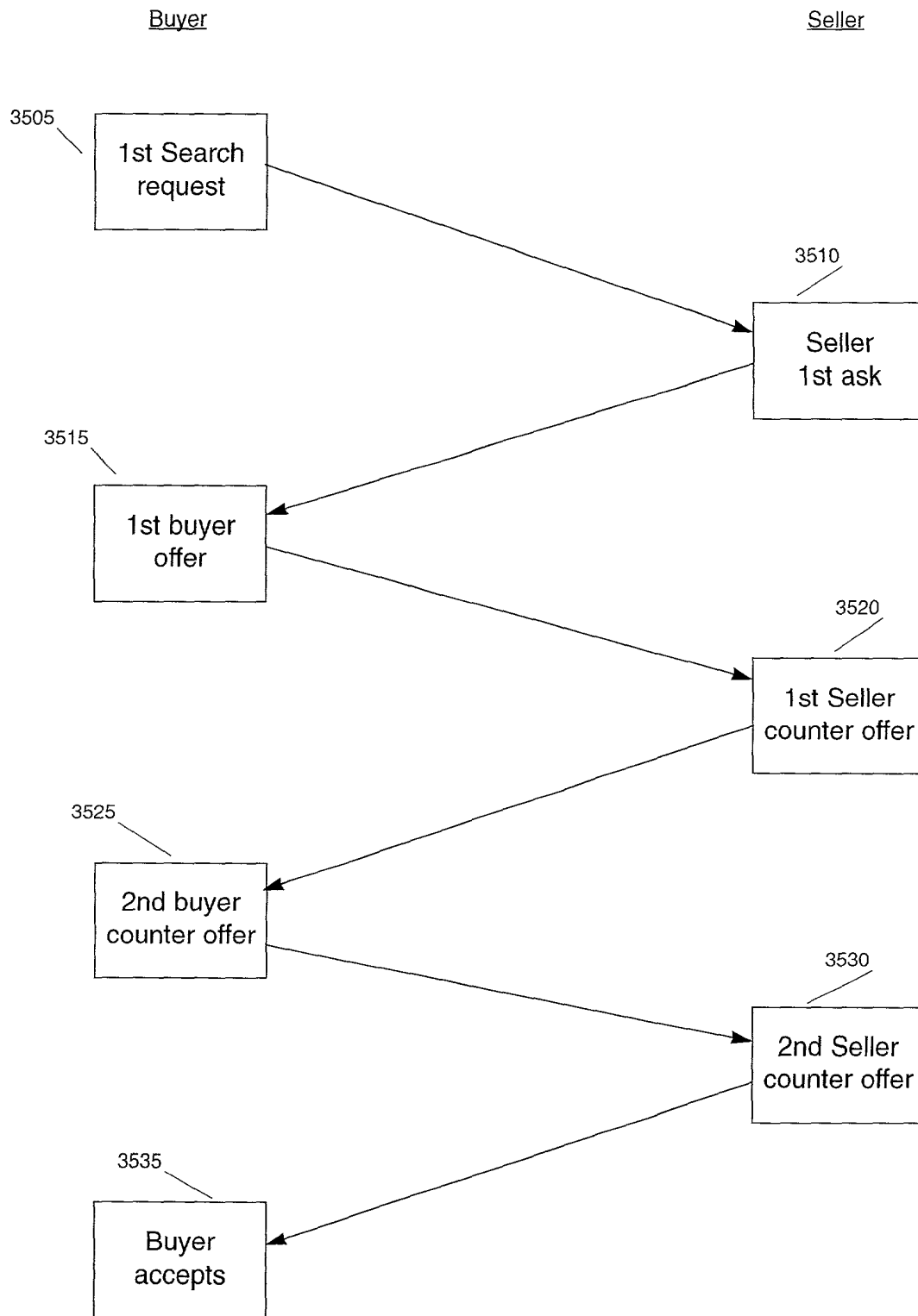
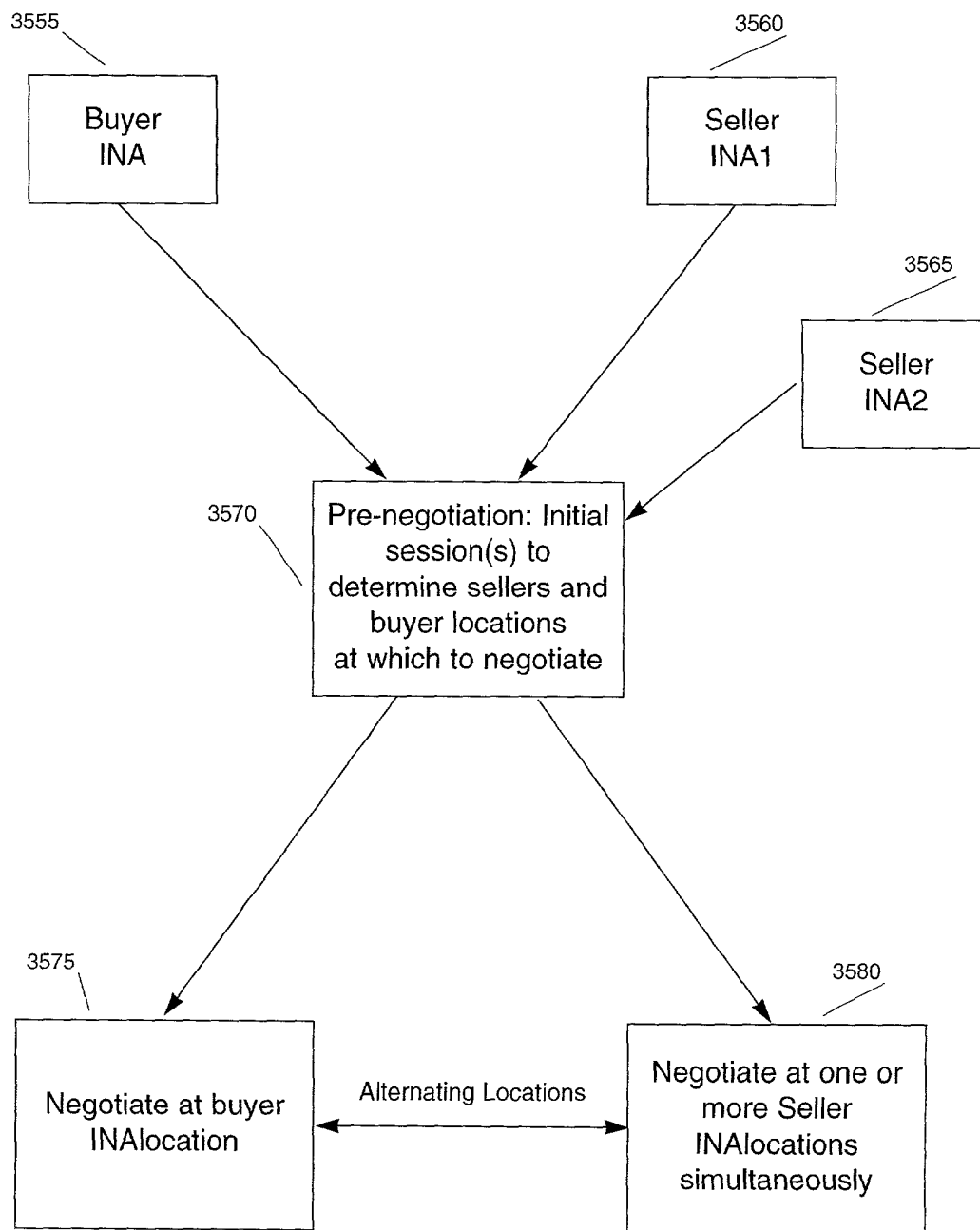


Fig. 35: Initial INA Mobile Location Protocol Settlement



**Fig. 36: Tournament Configuration of
INA Winner Determination**

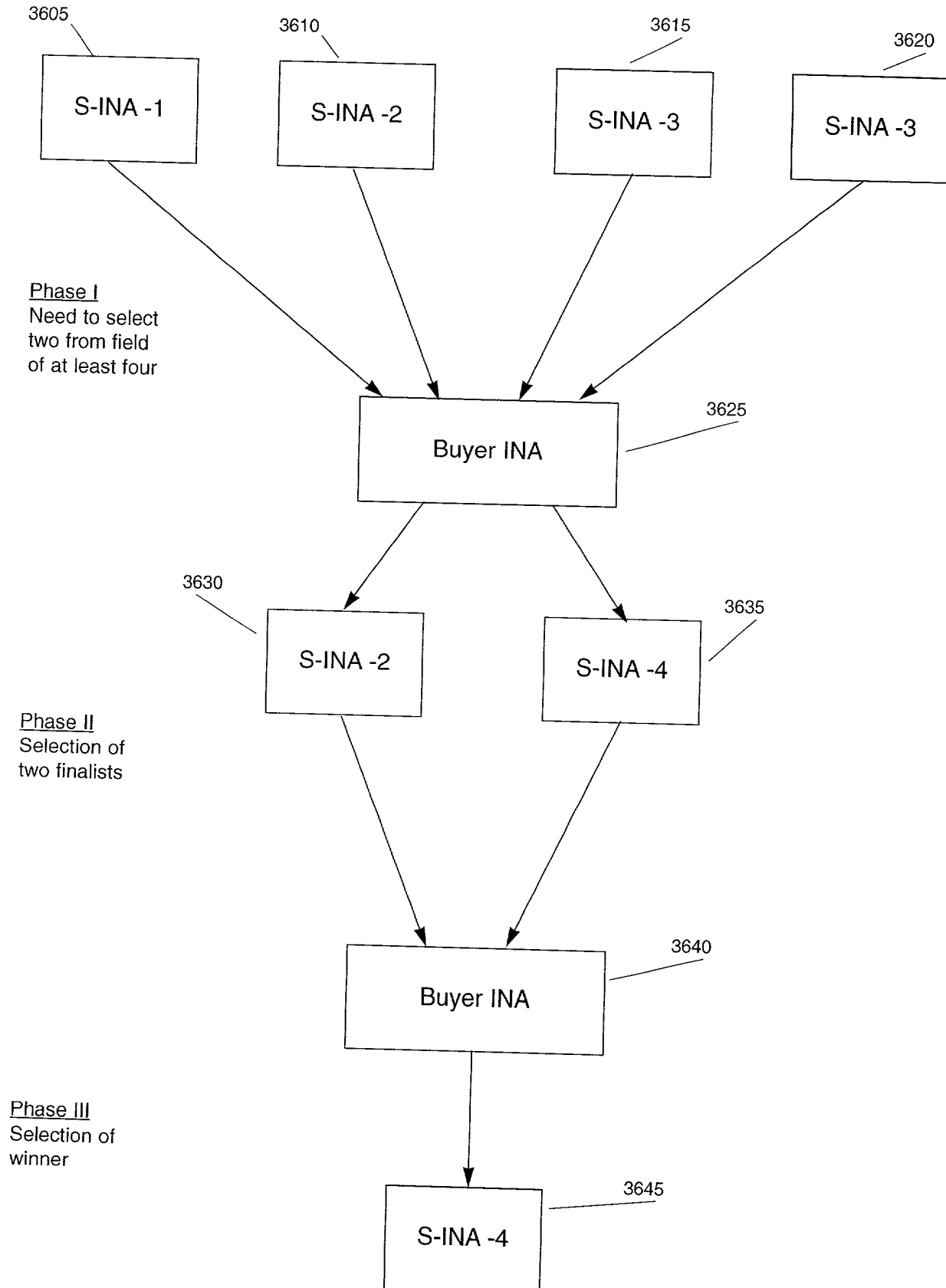


Fig. 37: Multivariate Negotiation

[Asks, bids and offers based on variables beyond price alone]

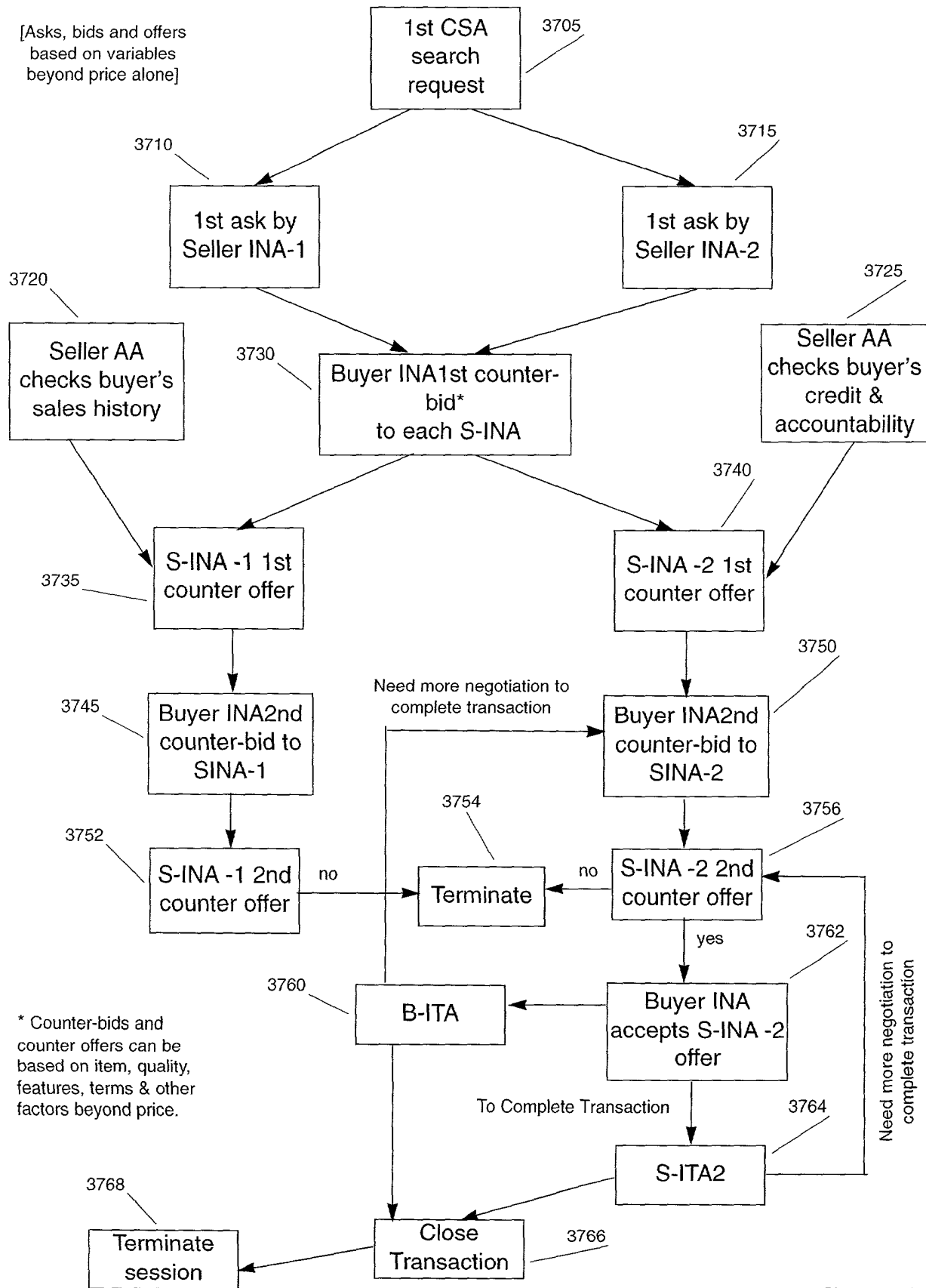


Fig. 38: Demand-Initiated Automated Negotiation Sequence Compromise Process Within Pre-established Parameters between One Buyer & One Seller

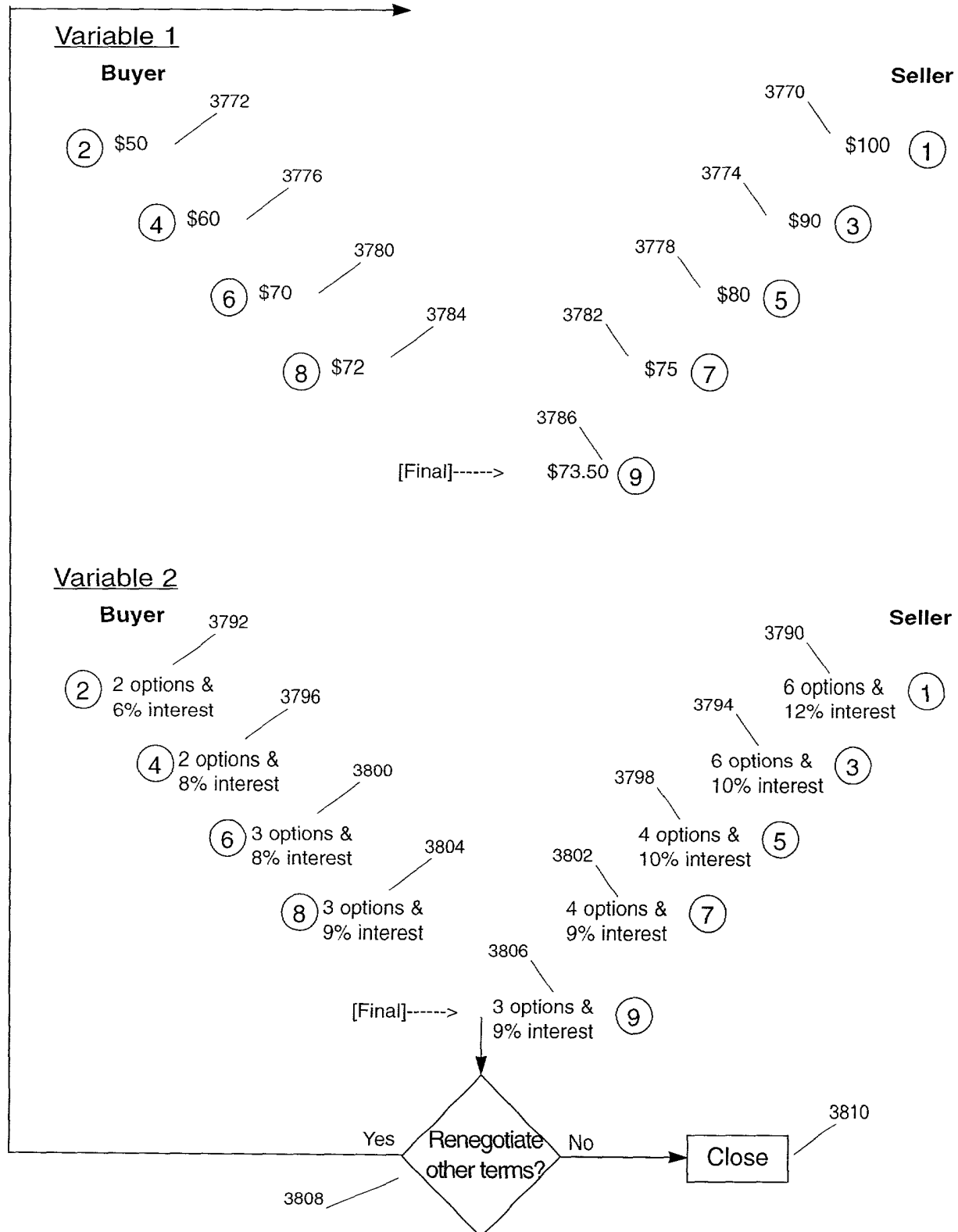
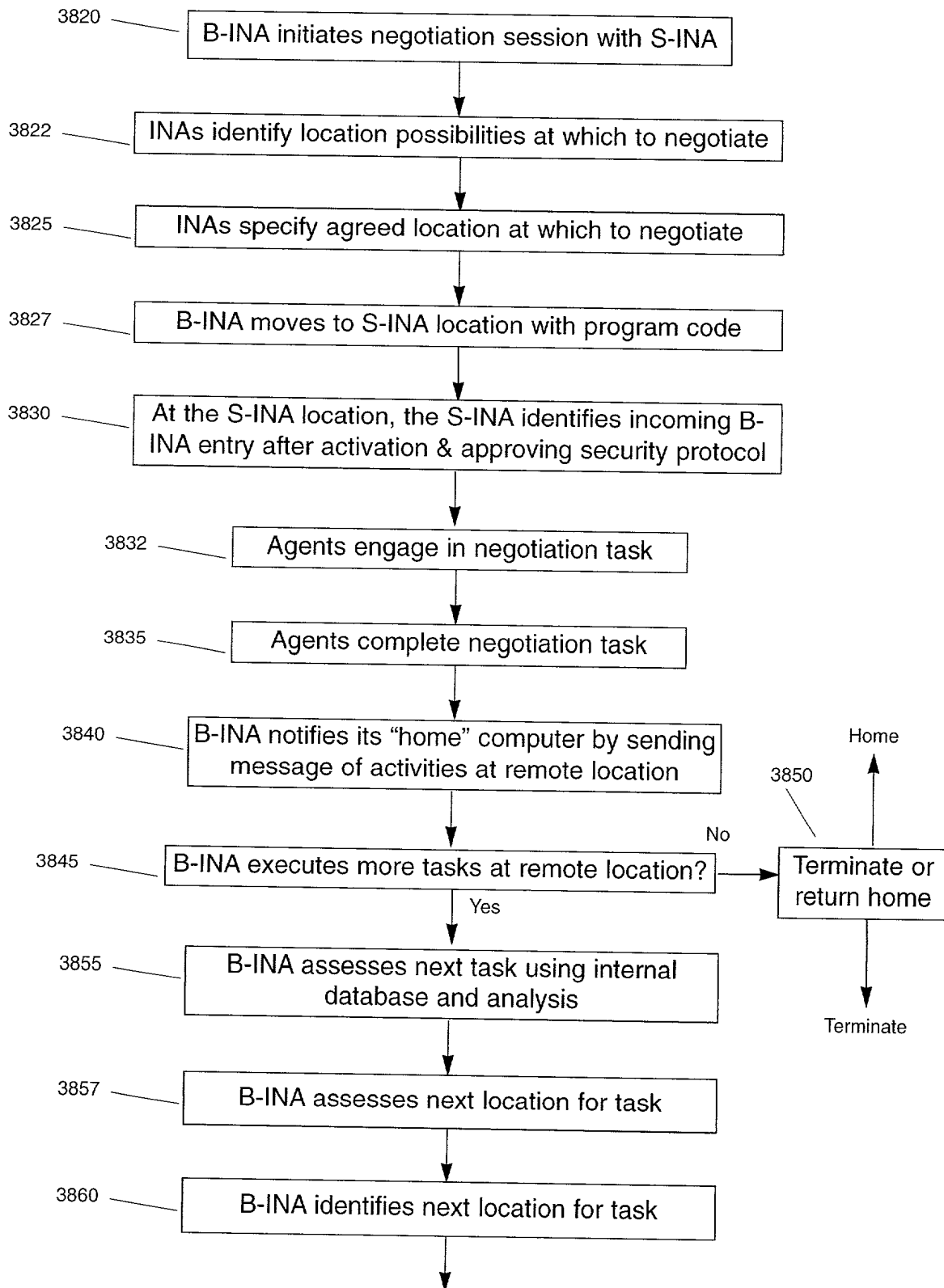
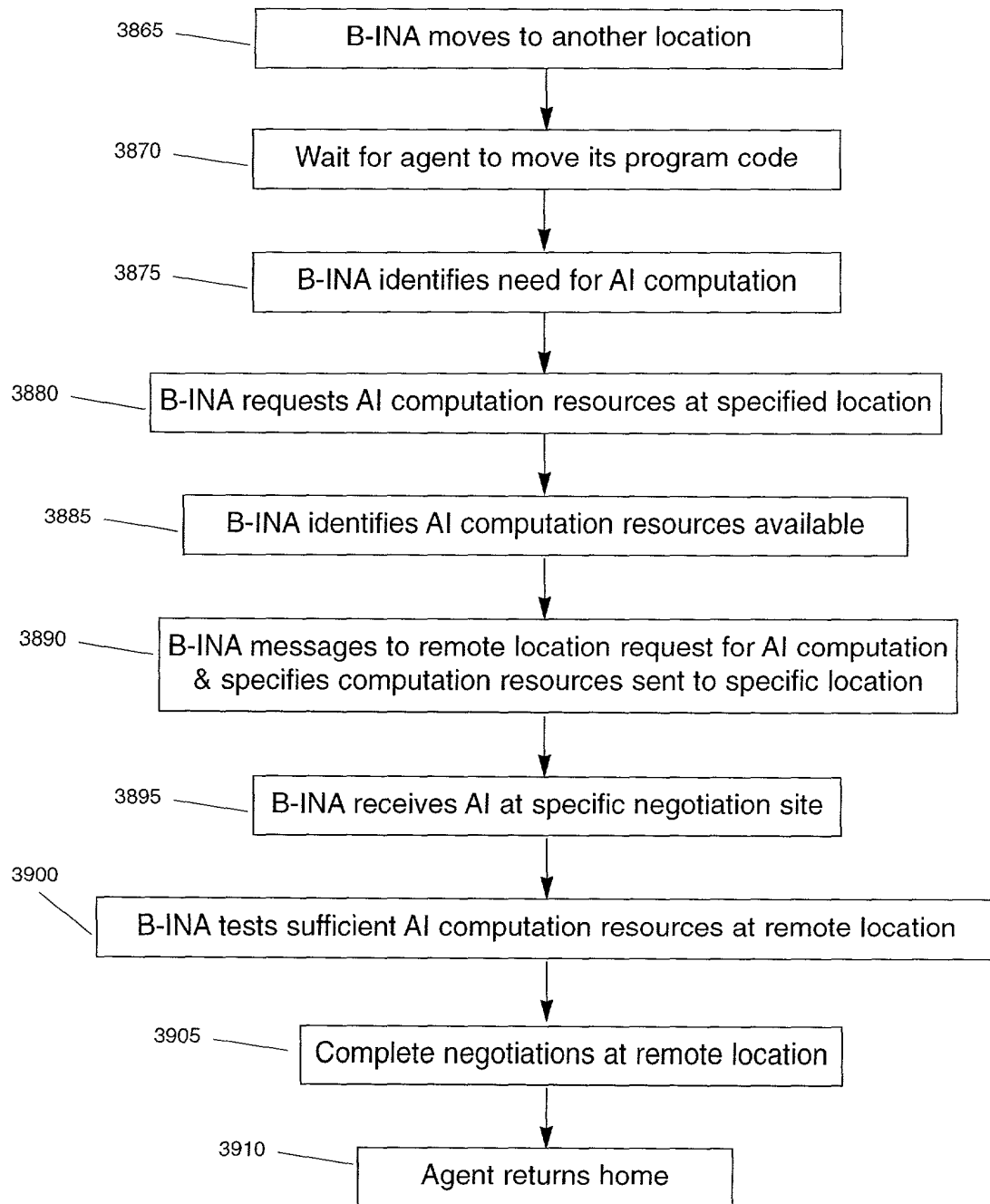


Fig. 39A: Negotiation in a Distributed System with Mobility



**Fig. 39B: Negotiation in a Distributed System with Mobility
(Continued)**



**Fig. 40: Multi-lateral Distributed Competition
(Competitive Double Shout Negotiation)**

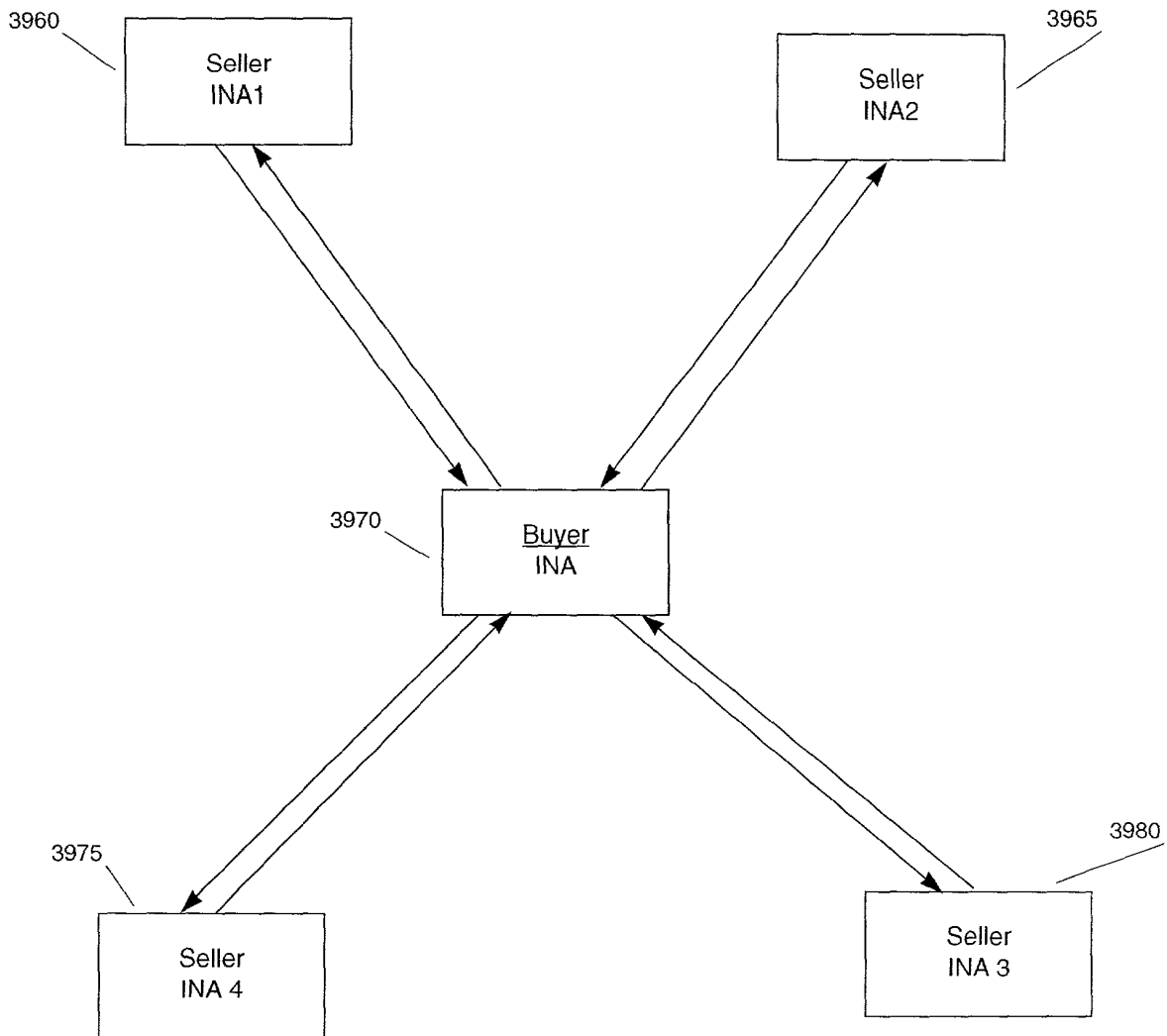


Fig. 41: Negotiation Module: Negotiation Method Schema

1 to 1 Interactive Negotiations

<u>Kinds Of Goals</u>	<u>Cooperative Goals</u> (Zero-Sum Game)	<u>Competitive Goals</u> (Zero-Sum Game)
Short Term goal (price - maximization)	1) Exchange-based approach: Trade-off of terms/variables between parties	1) dialectical approach: give & take of opponents until resolution
-vs-	a) matching of interests: ascertain mutual interest with overlapping sets...	a) [position description & justification] explanation based: each position advances and develops
Long-term goal (relationship management)	b) prioritizations of preferences: hierarchy of similar priorities	b) [Interrogation] argumentation: critique of opponent's position*
		c) [Ascertain mutual self-interest] Assessing overlapping interests
		d) Selecting common sets
		*Anticipate opponent's strategy
<u>Constraining Factors</u>	2) Problem-solving approach: parties seek a common solution	<u>Non-Zero-Sum Game</u>
1) Time constrained: multi-sessions as instrumental changes	a) assessing common interests among different positions	1) deterrence approach: behaving so that competitors do not get without higher cost
2) Information constrained: less than optimum information	b) compromise of positions to a common set shared by parties	a) bidding aggressively and/or deceptively and then withdrawing
3) Choice Constrained: Limiting of options	<u>Buyer-Initiated</u>	<u>Seller initiated</u>
	[Negotiation as adjustment of seller parameters]	[Negotiation as disagreement with initial seller promotions]
	a) buyer query as initiation	a) promotions or 1st seller bid (result of search query) as 1st point of departure
	b) priority of best and then second best, and then third best, etc...	
<u>Terms</u>	<u>Multiple Parallel Interactive Negotiations</u>	
1) Item terms	<u>One to several</u>	<u>Several to several</u>
2) Transaction terms	a) Stopping negotiation when one winner is selected	Single Item: Stopping negotiation when one buyer & 1 seller is selected
		Multiple items: a) Stopping negotiation when mutual agreement of multiple parties

Fig. 42: INA Auction Module-Auction Types

Auction Types	
English (Increasing)	Dutch (Decreasing)
Vickrey (second highest bid)	“combinatorial” multiple-item auctions (package deals)
Combinations of auction types	Double-shout

Fig. 43: Negotiation, Pricing & Auction Module Interactions

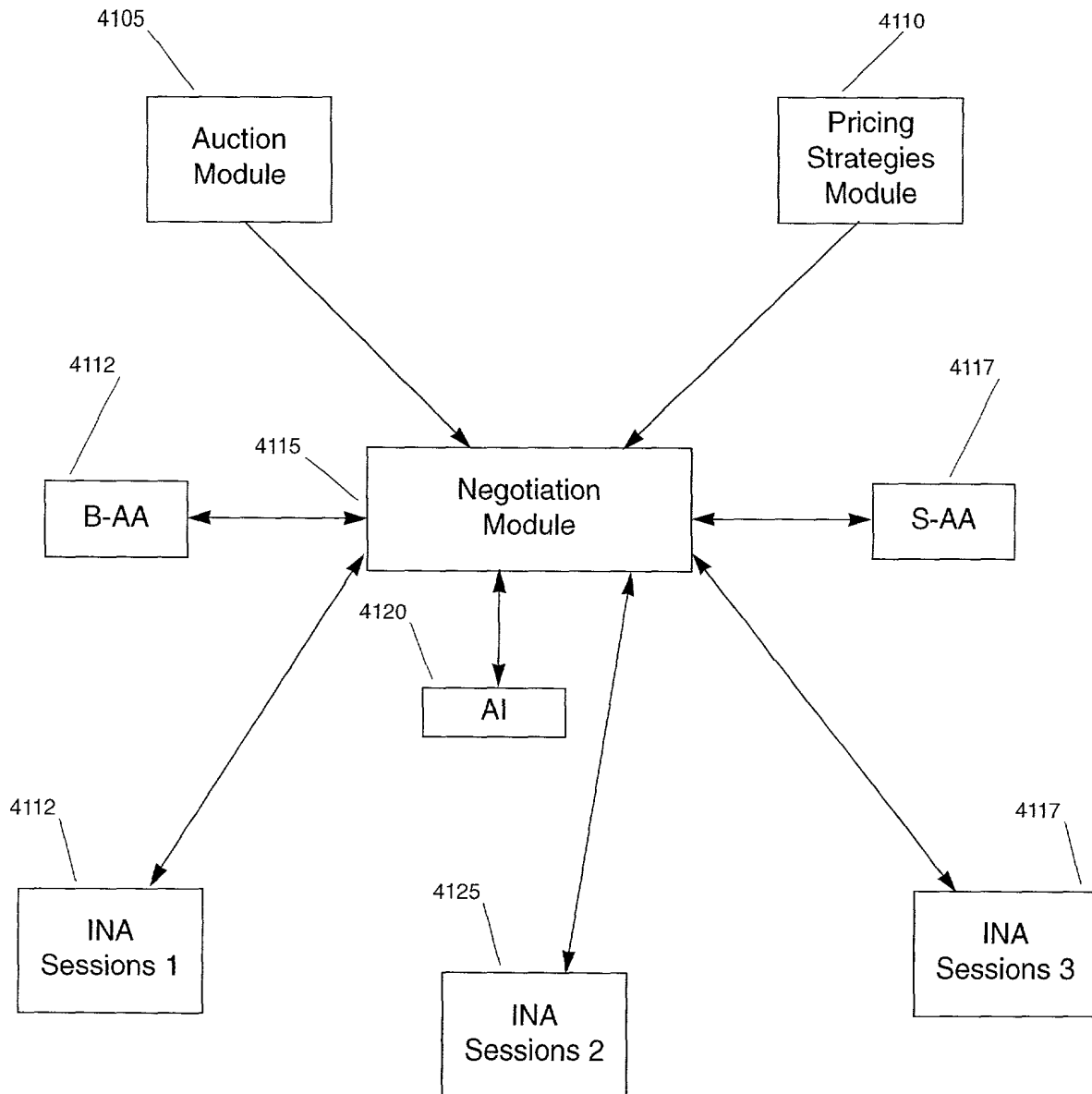


Fig. 44: Pricing Strategies Module and AA Interactions

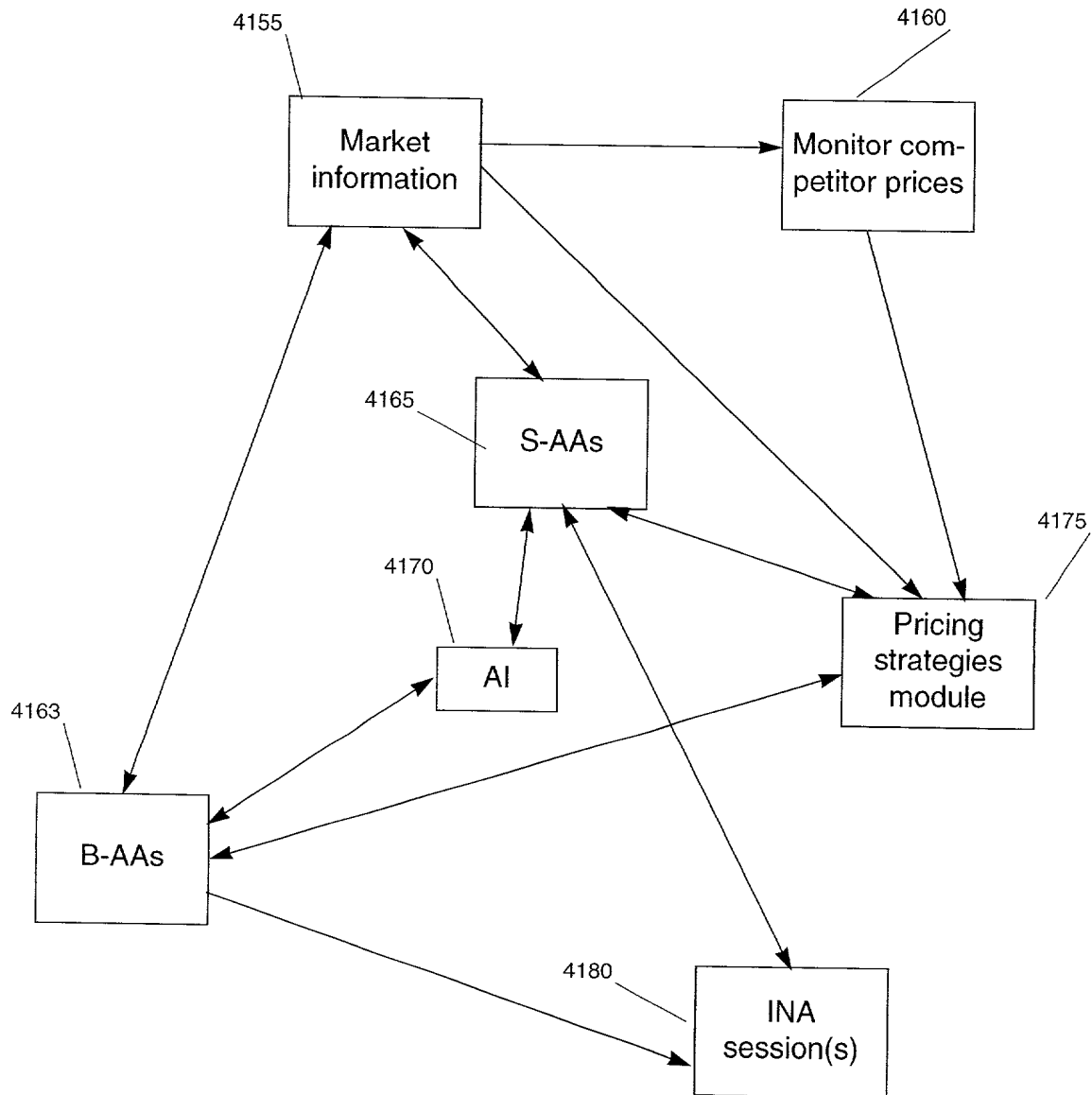


Fig. 45: Interaction Dynamics of INA“Personalities”

Yield Management	-Seller surpluses -Buyer shortages		-Seller shortages -Buyer surpluses
INA Stance	Optimistic		Pessimistic
INA Stance	Opportunistic (exploit)	neutral	Conservative (wait)
INA Stance	Aggressive (rush)	neutral	Unaggressive (delay)
Combination of INA Stance	Alternating between various “Attitudes” primarily to disguise INA Stance(s)		

**Fig. 46: Neutral Broker Agency
C-INA Intermediation & Aggregation Applications**

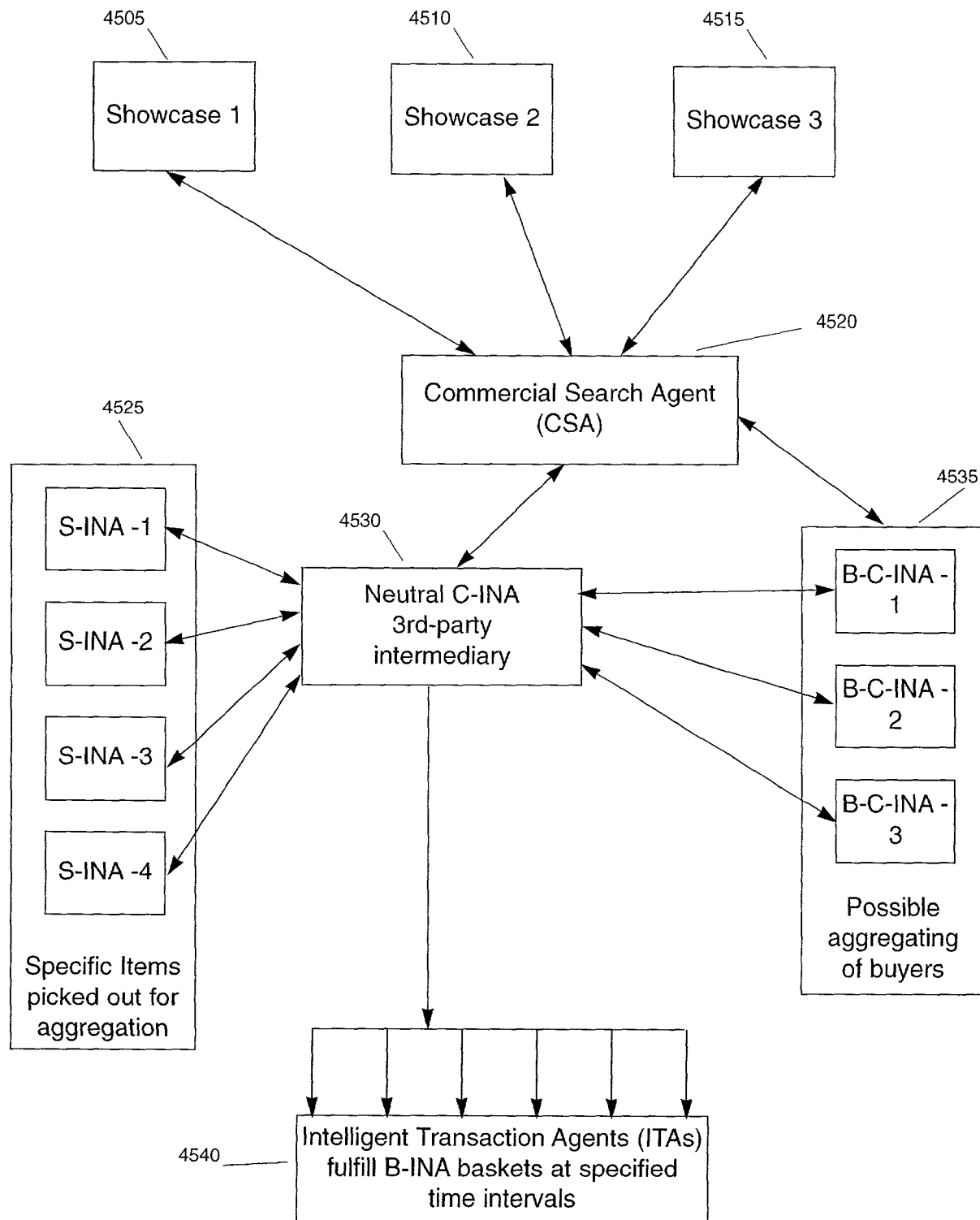


Fig. 47: C-INA Transaction Initiation Sources

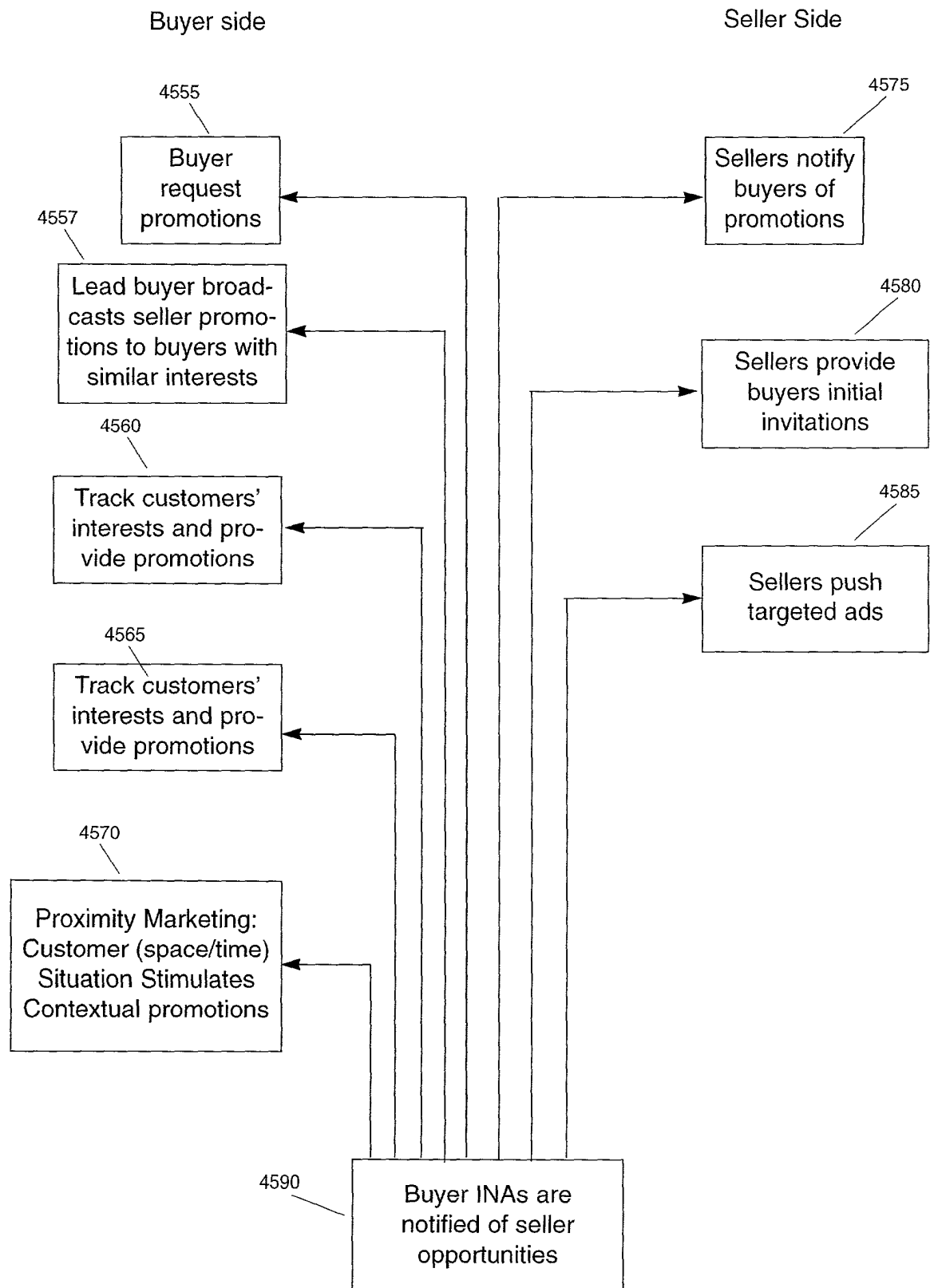


Fig. 48: B-C-INA Aggregation

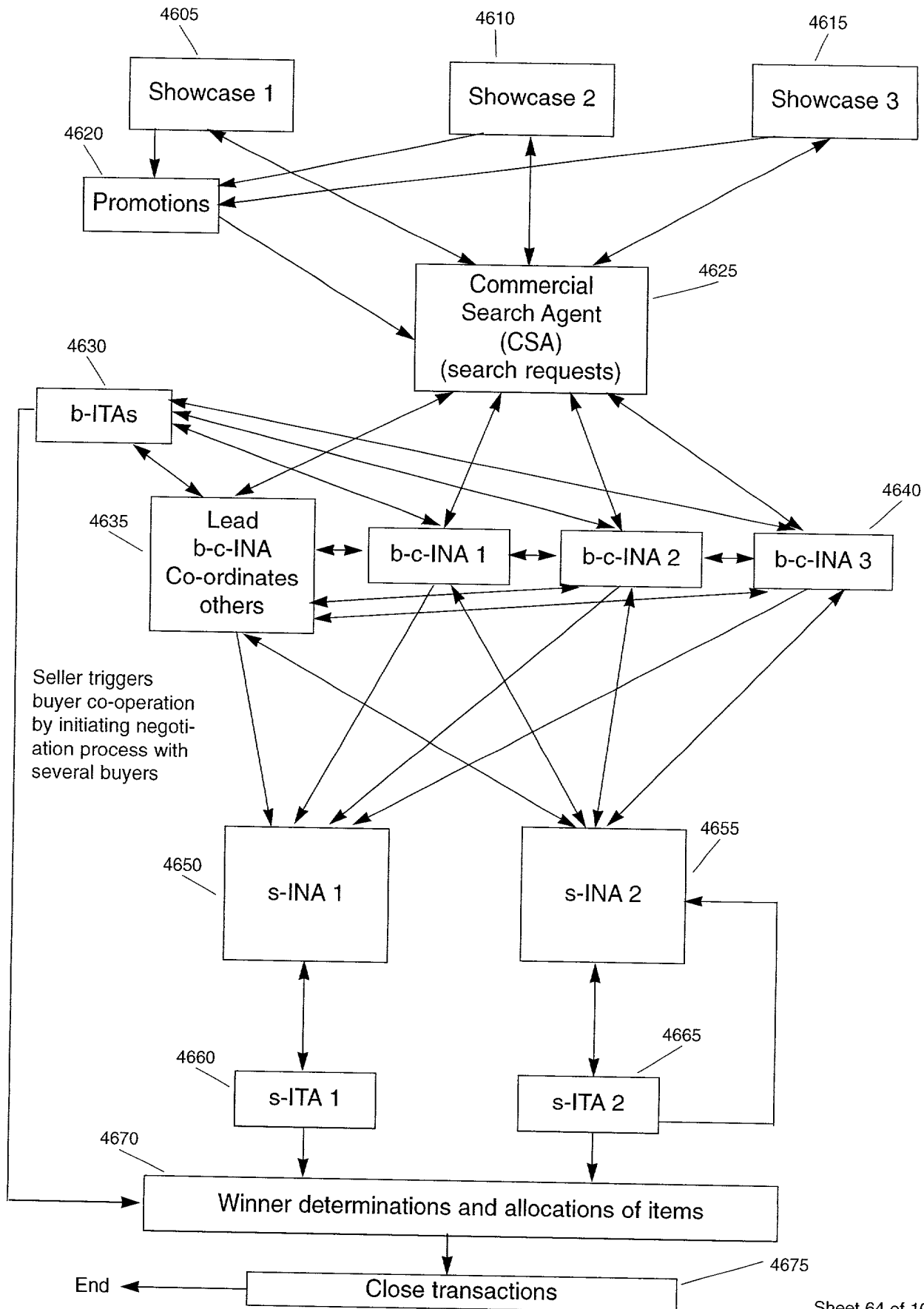


Fig. 49: Automated Aggregation Category Structures

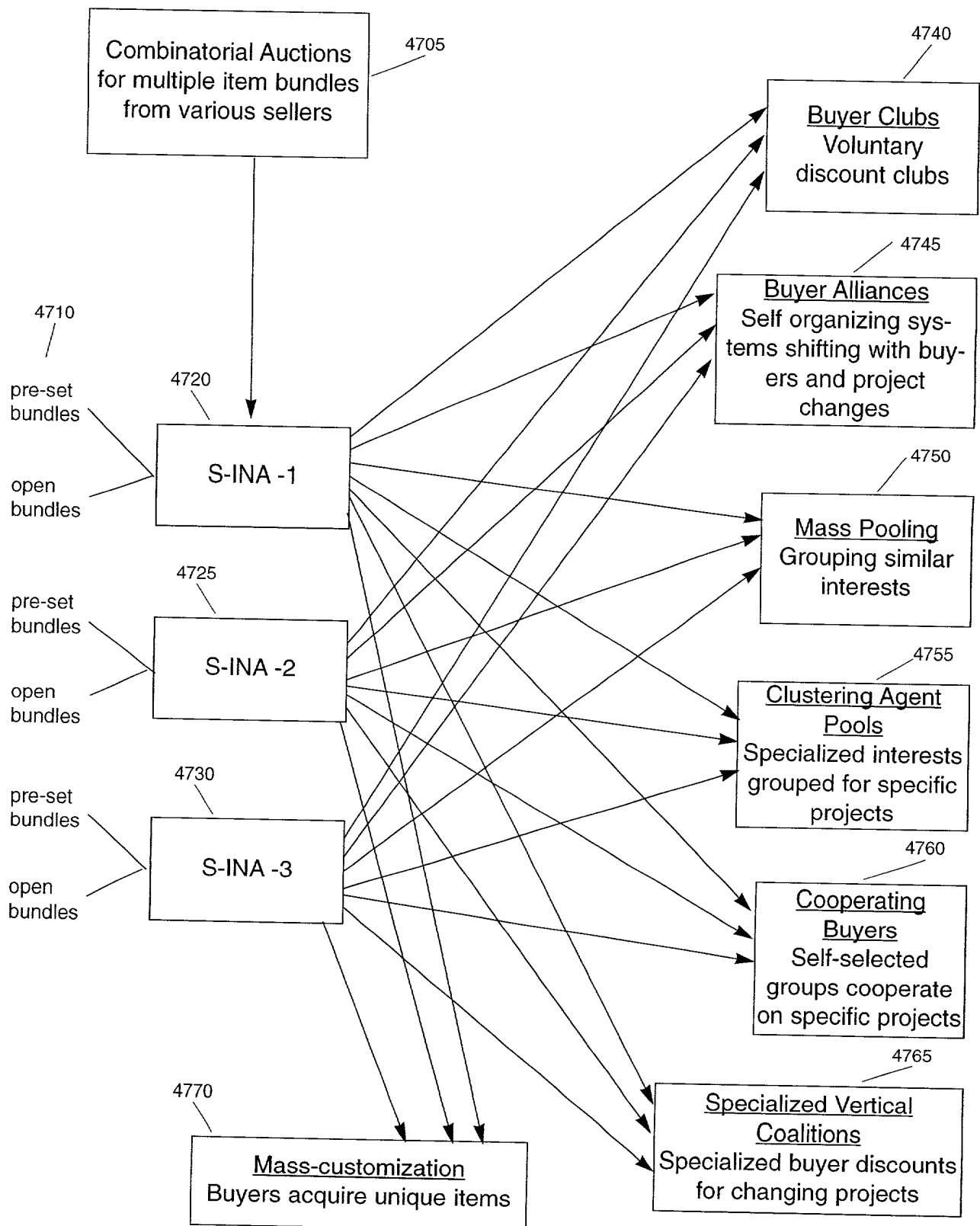


Fig. 50: Aggregation I – Mass Pooling

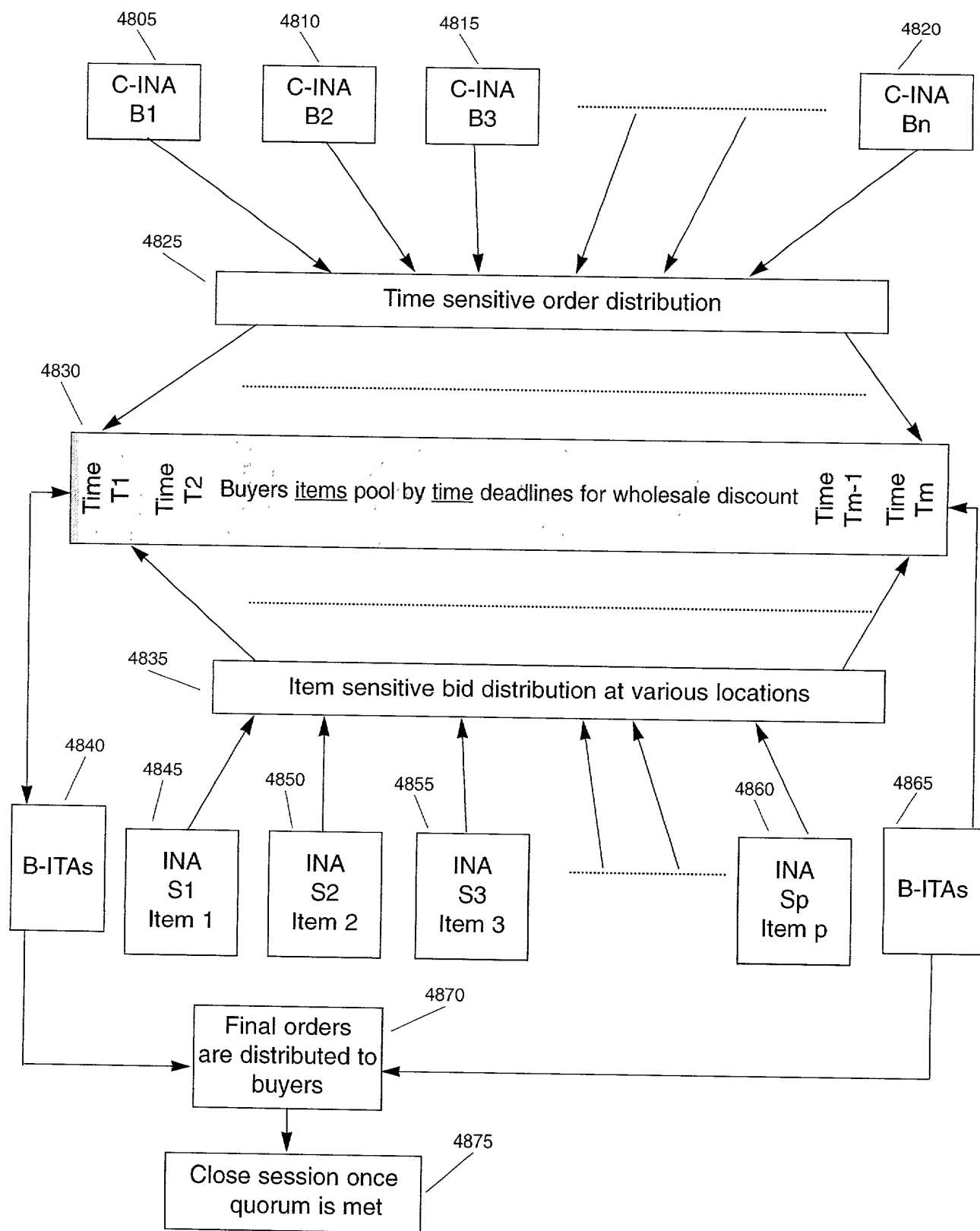
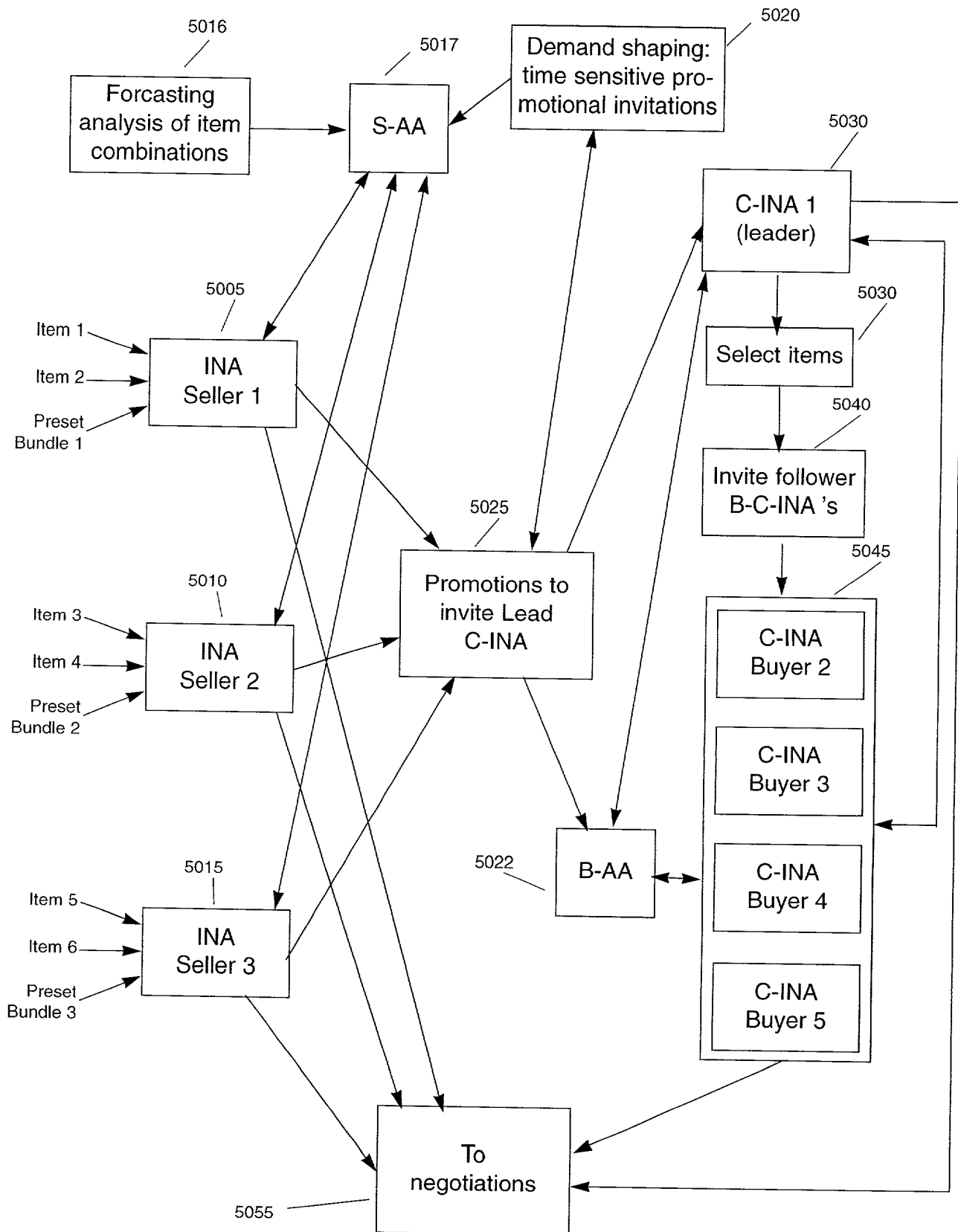
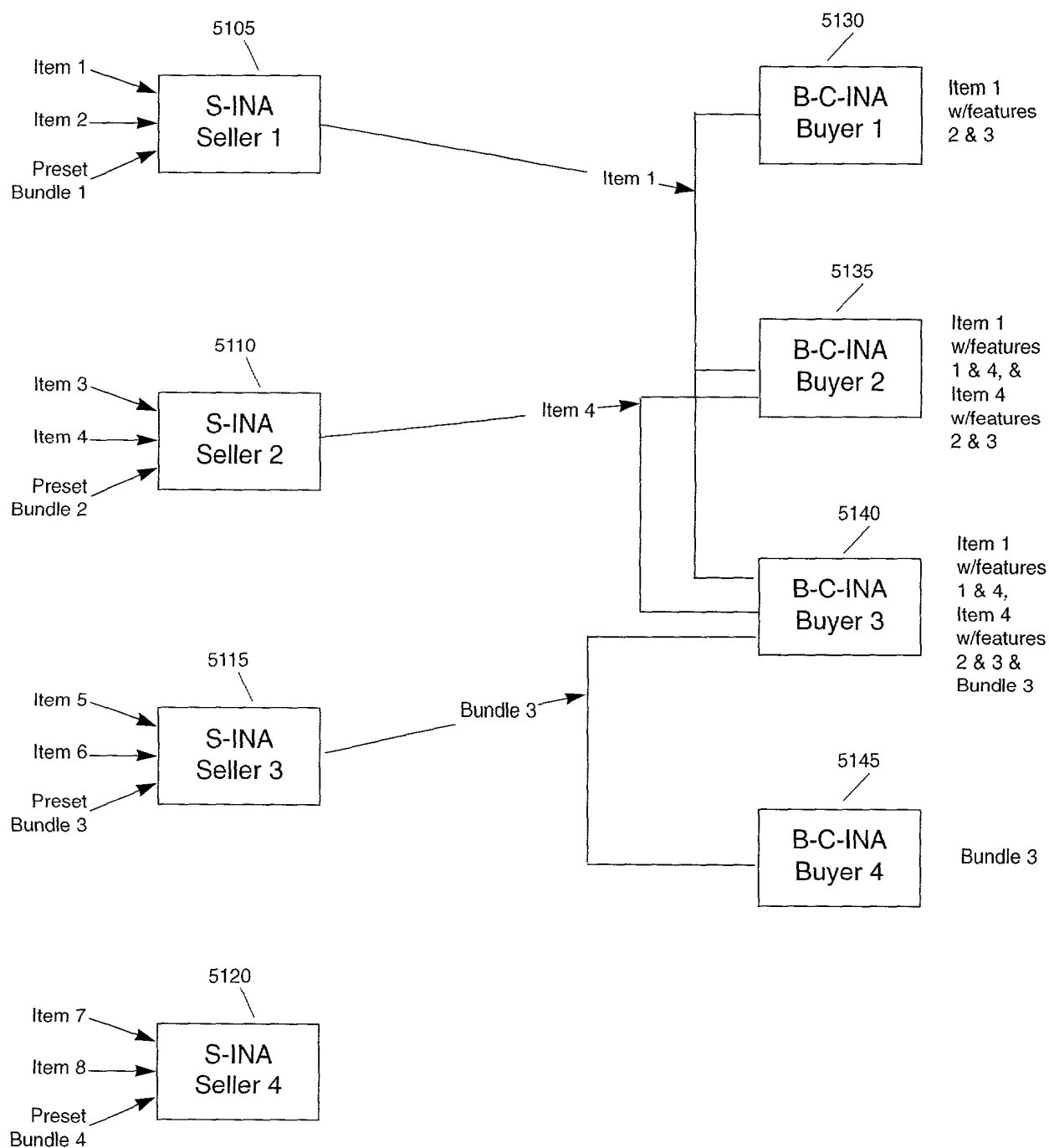


Fig. 51: Aggregation II–Disintermediated Aggregation Method Prior To Negotiation

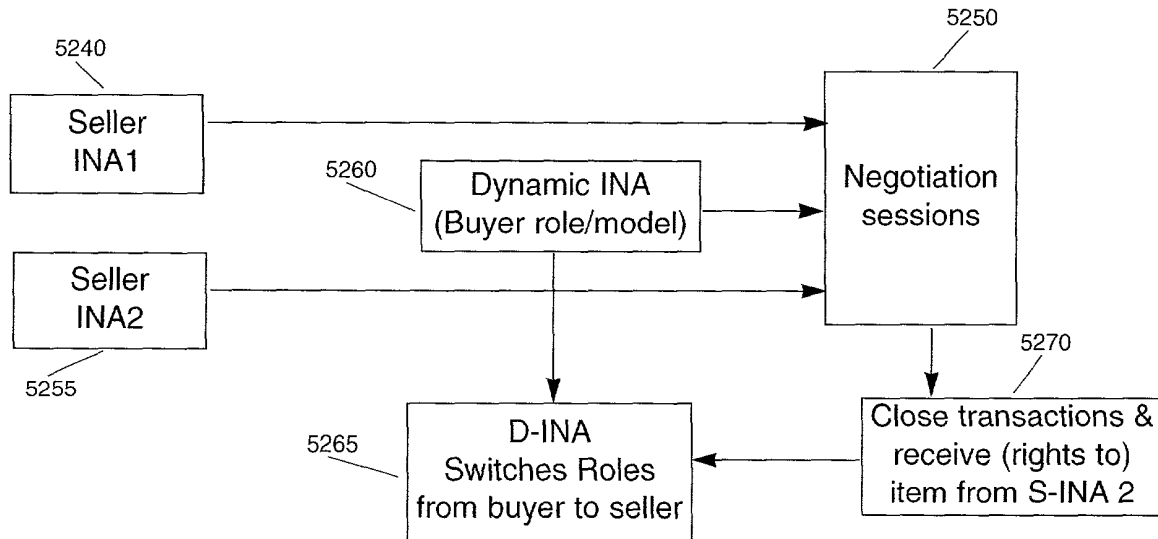


**Fig. 52: Aggregation III –
Disintermediated Mass Customization**



**Fig. 53: Dynamic D-INA 's Double-agents:
Arbitrage Applications**

Phase I



Phase II

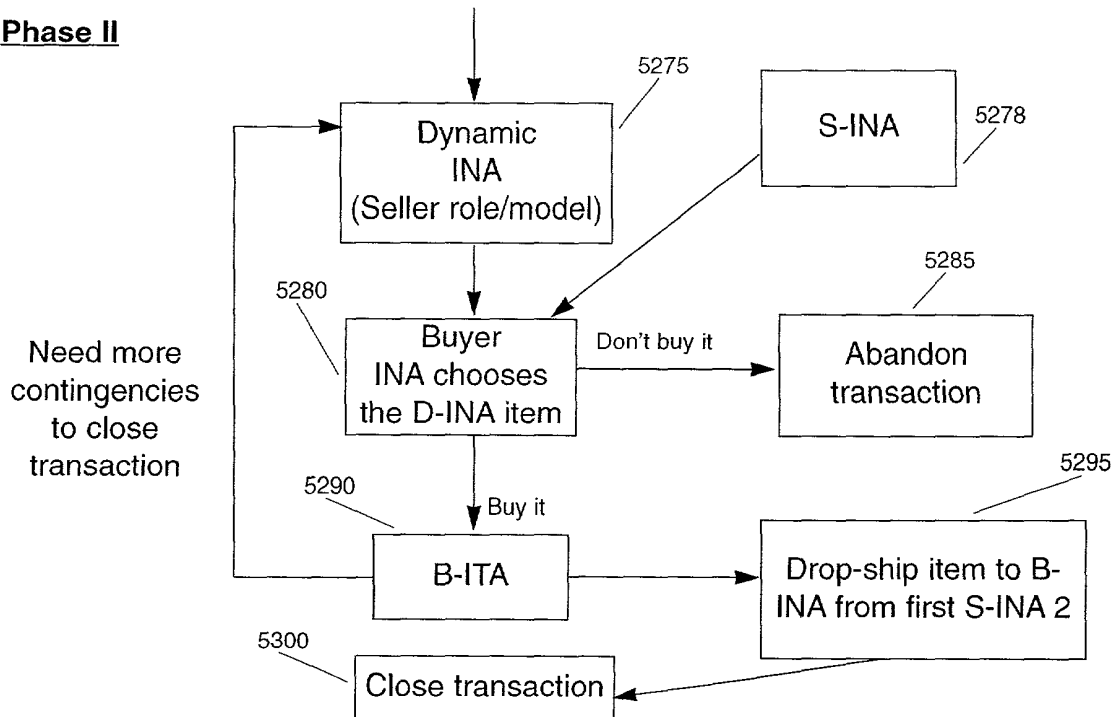


Fig. 54: Traditional Combinatorial Auction with Intermediary: Between Single Seller and Multiple Buyers

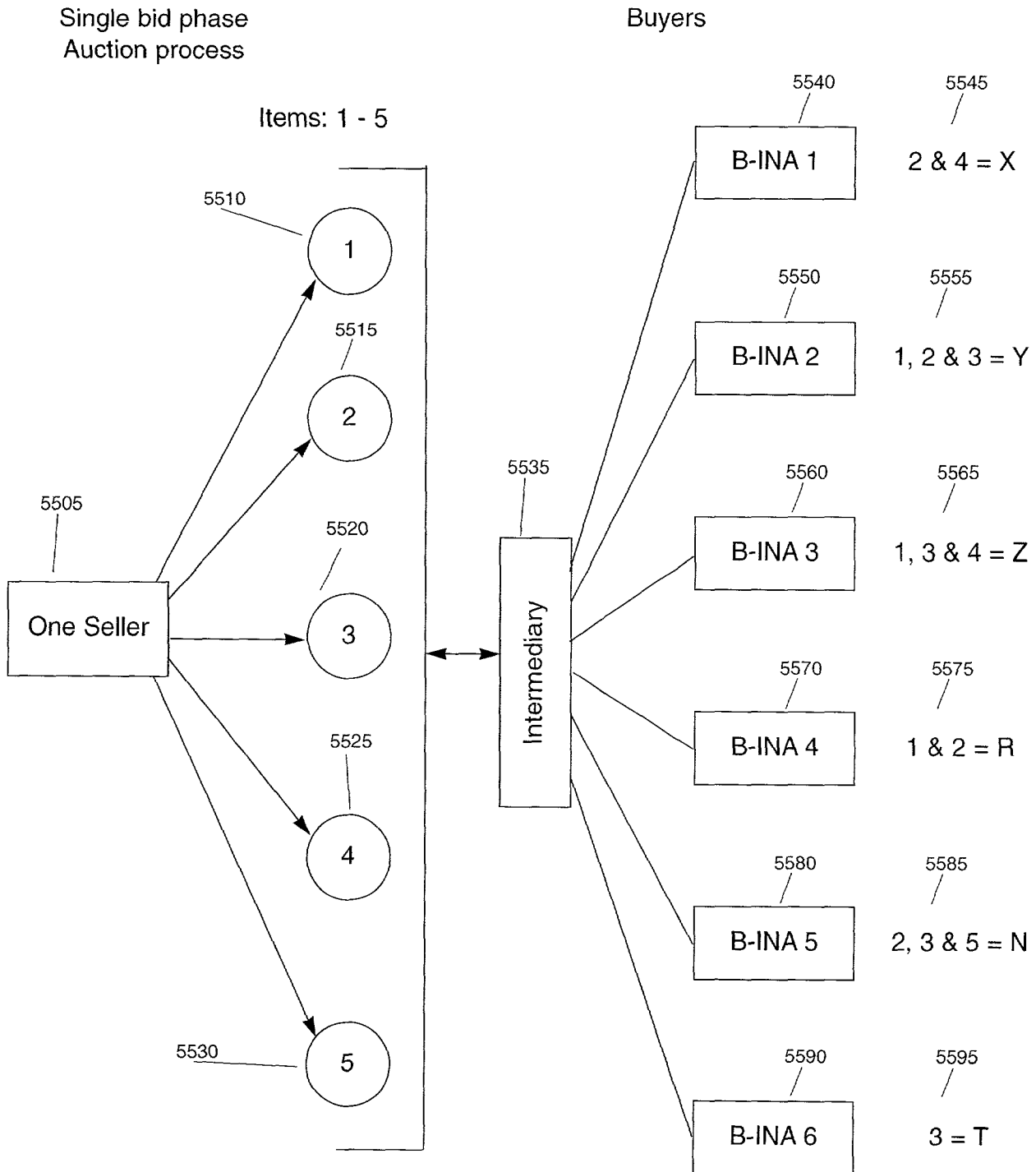
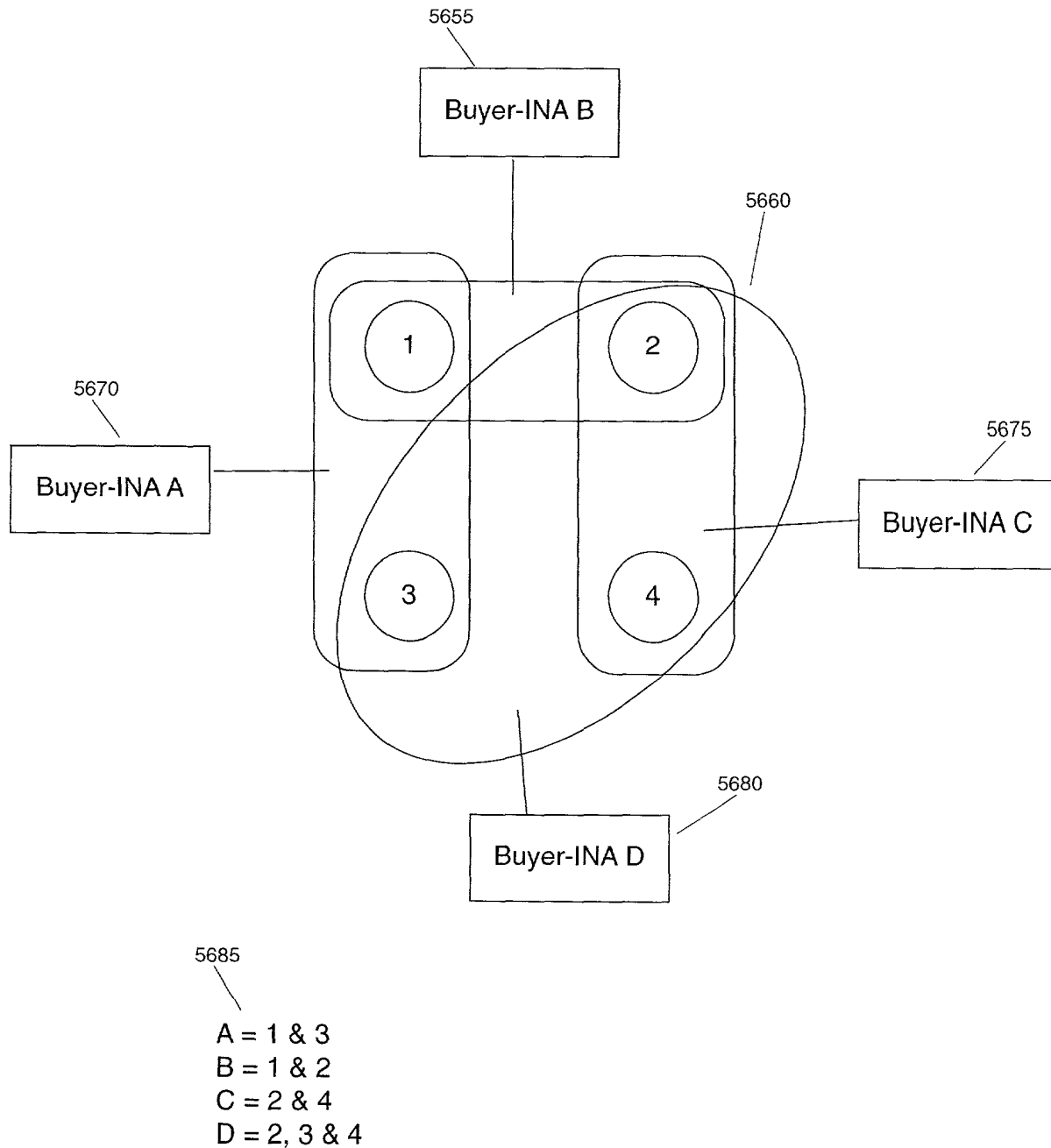


Fig. 55: INA Combinatorial [Double] Auction between Single Seller with Multiple Items and Multiple Buyers



**Fig. 56: Final Session
Winner Determination of Interactive Multi-lateral Auction**

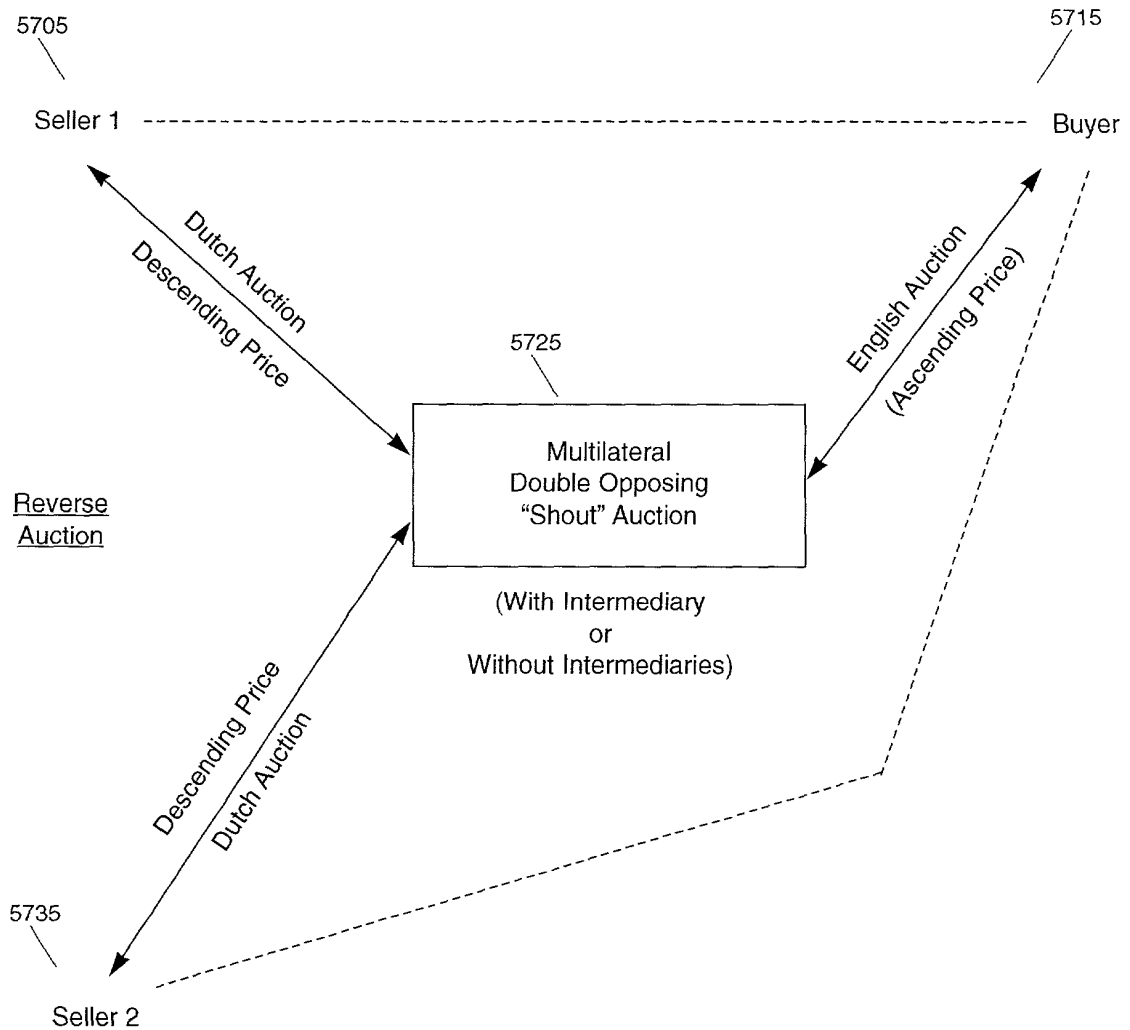


Fig. 57: Factor Filters

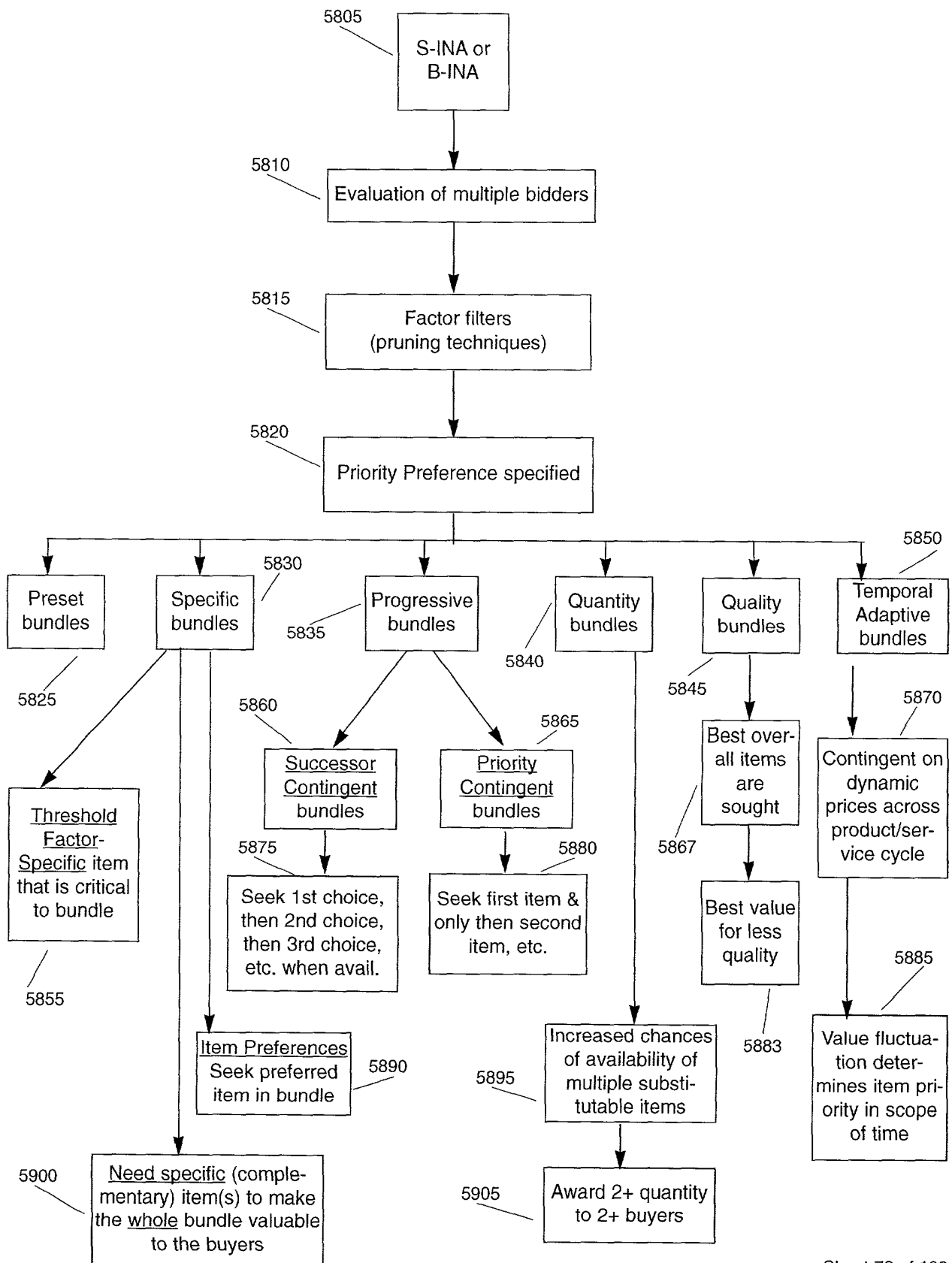


Fig. 58: Disintermediated Multi-item Bidding From One Seller To Multiple Buyers

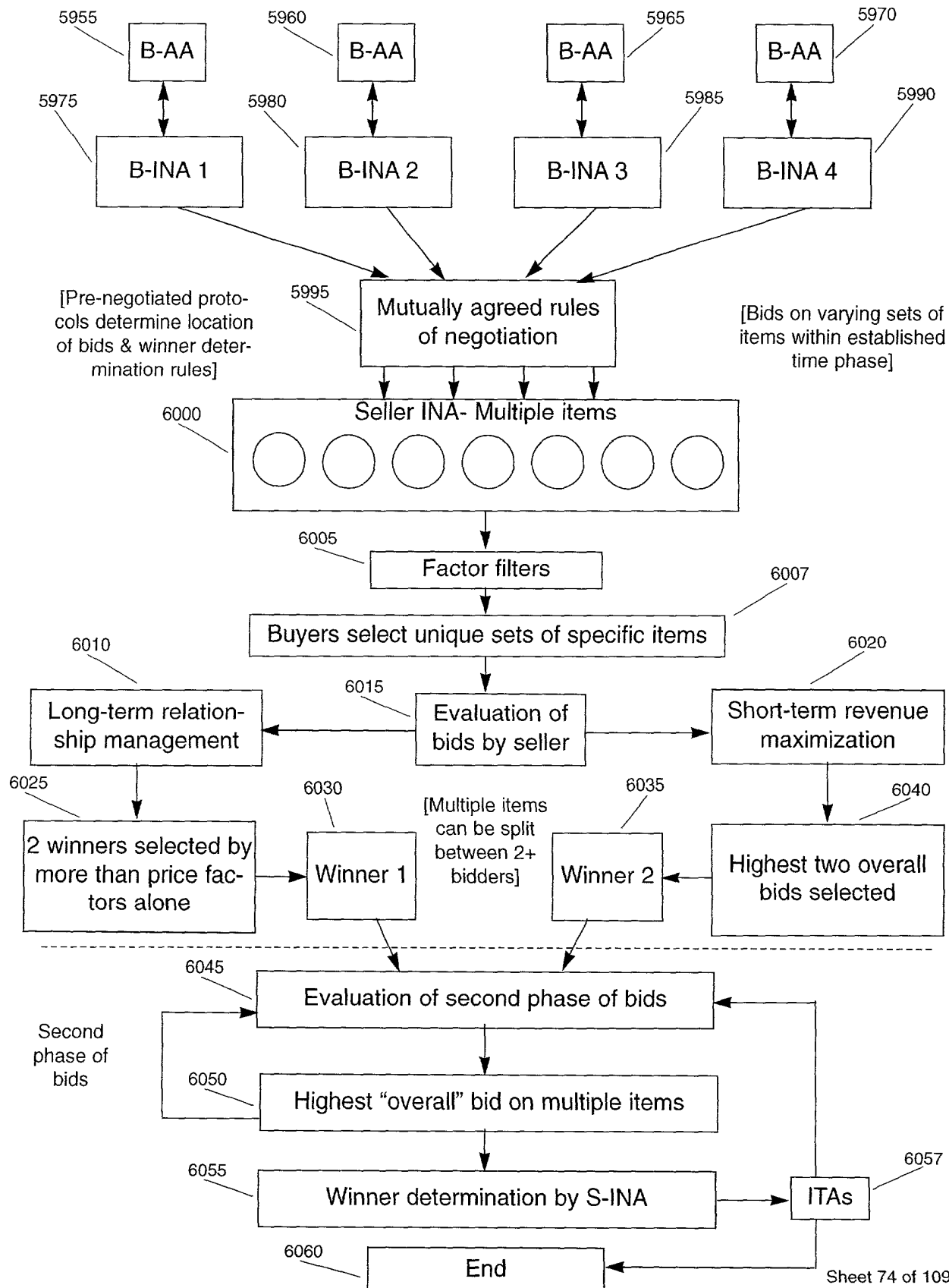


Fig. 59: Disintermediated Multi-item Bidding between Multiple Sellers and Single Buyer

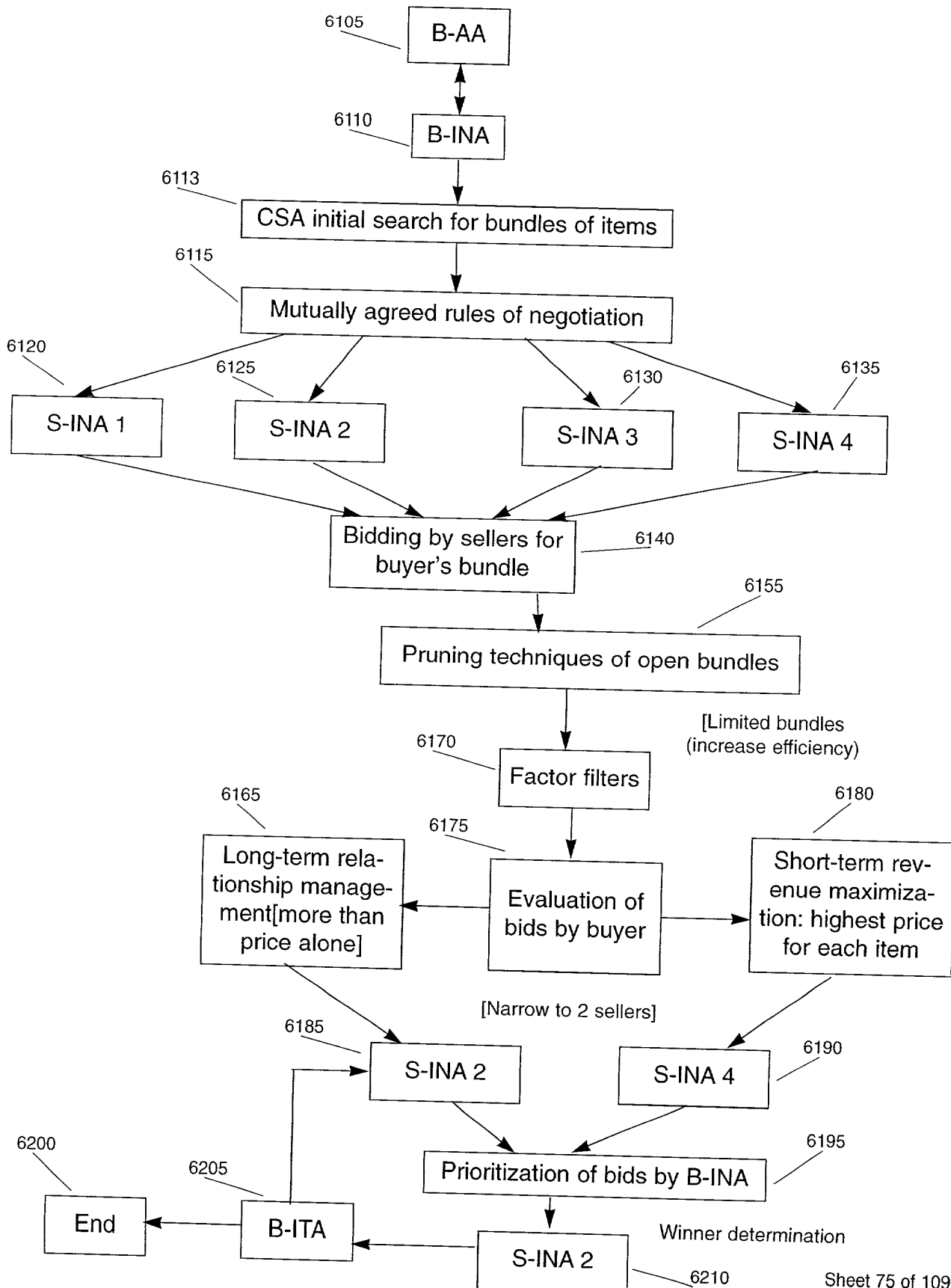


Fig. 60: Disintermediated Aggregation of Pre-Set Bundles between Multiple Sellers & Multiple Buyers

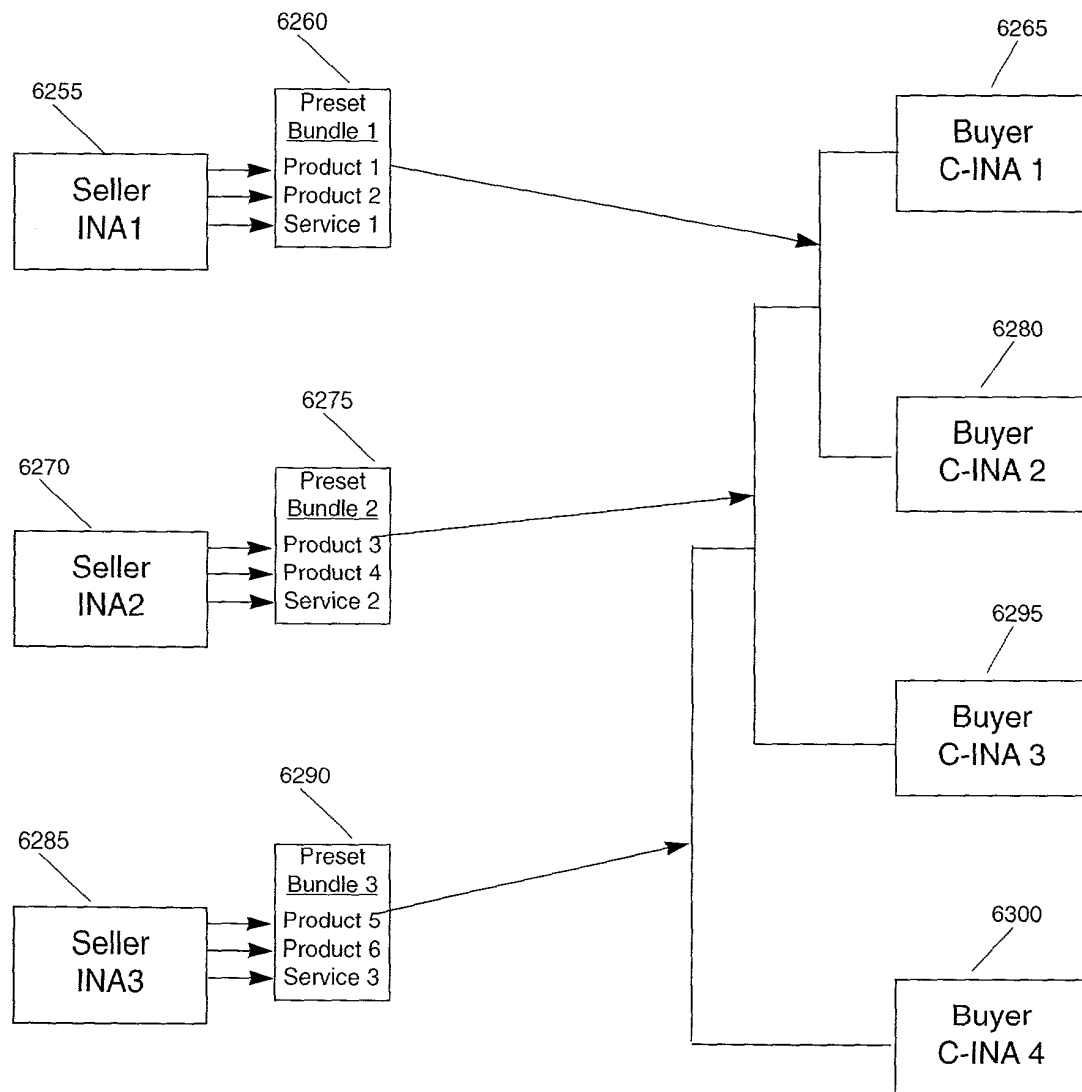
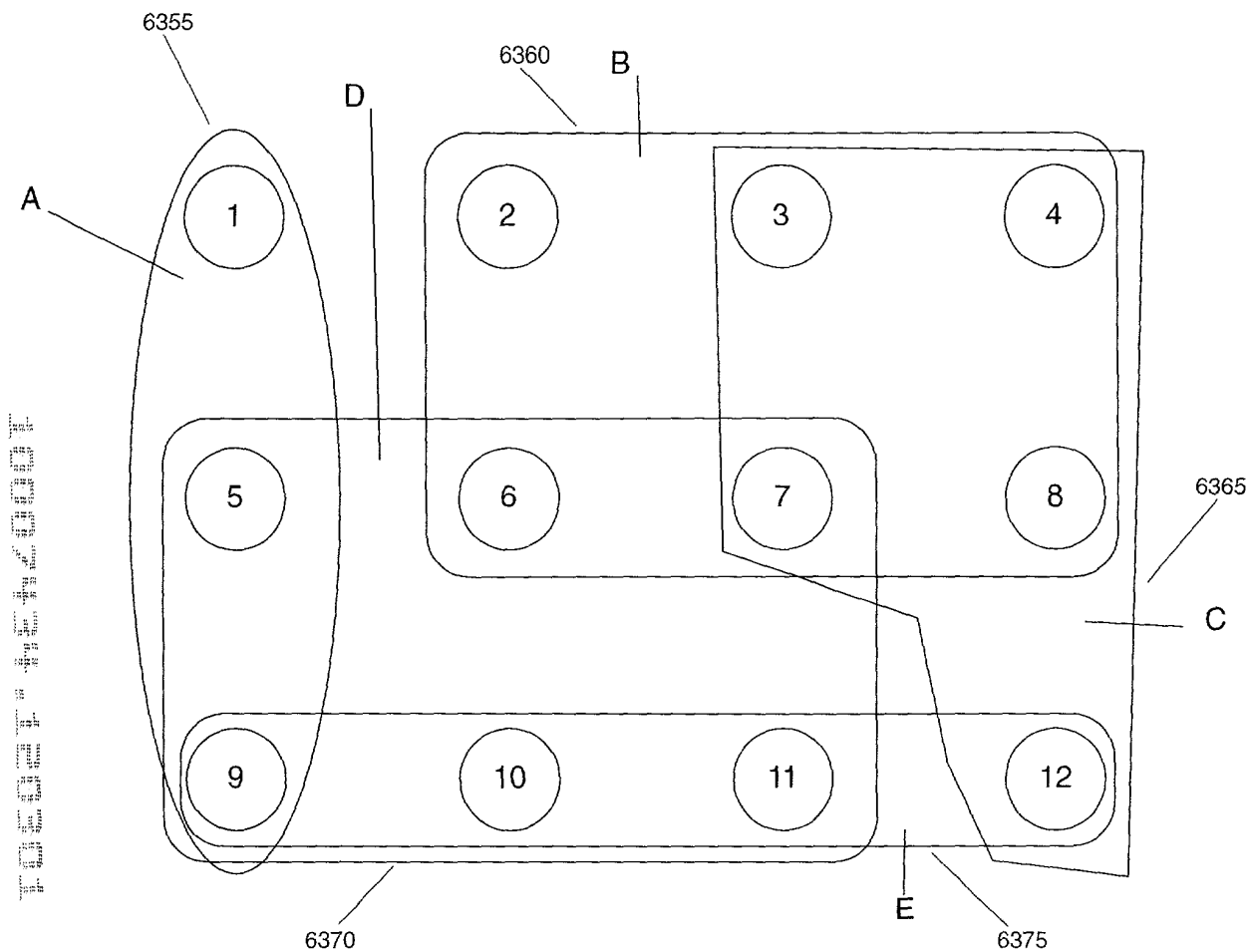


Fig. 61: Disintermediated Multi-item Bidding Between Multiple Sellers & Multiple Buyers



1 – 4: Seller I
 5 – 8: Seller II
 9 – 12: Seller III

Buyer Bidder A: 1, 5, 9
 Buyer Bidder B: 2, 3, 4, 6, 7, 8
 Buyer Bidder C: 3, 4, 7, 8, 12
 Buyer Bidder D: 5, 6, 7, 9, 10, 11
 Buyer Bidder E: 9, 10, 11, 12

Fig. 62A: Disintermediated Aggregation Of Multiple-item Bundles Bidding From Multiple Sellers To Multiple Buyers using C-INA 's

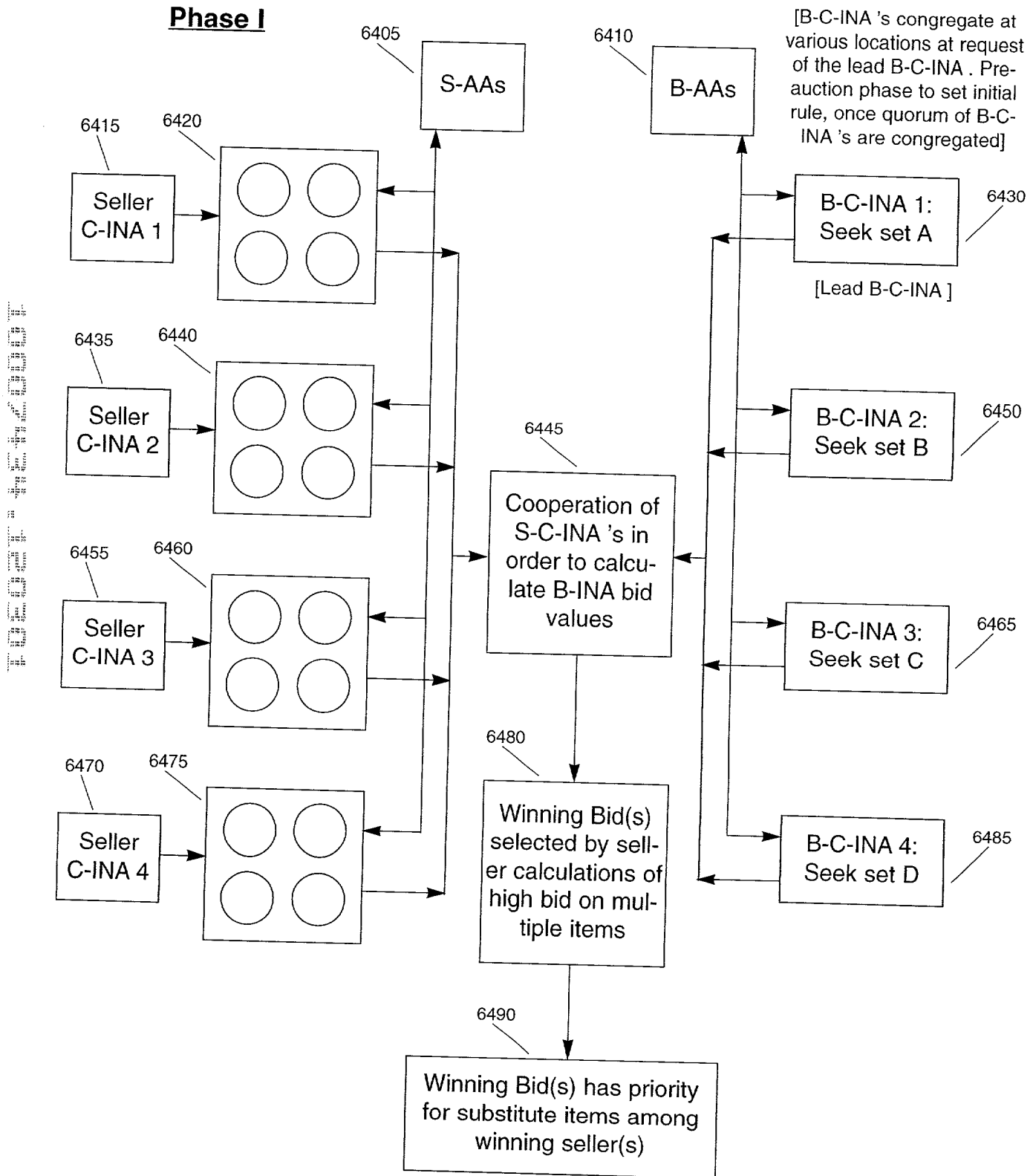


Fig. 62B: Disintermediated Aggregation Of Multiple-item Bundles Bidding From Multiple Sellers To Multiple Buyers using C-INA 's (continued)

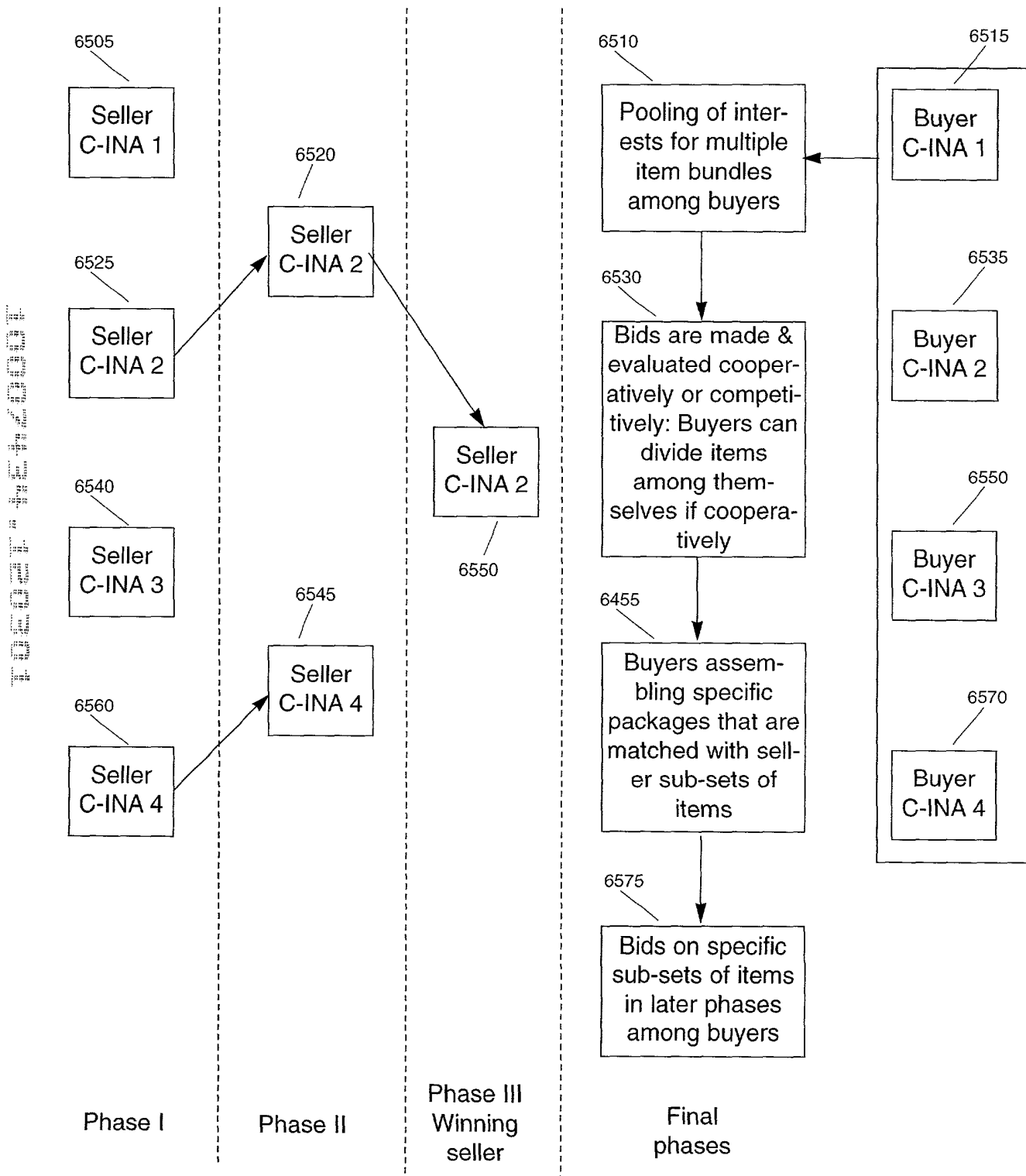


Fig. 63: Disintermediated Arbitrage Of Multi-item Bundles Between Multiple Sellers & Multiple Buyers using D-INA 's

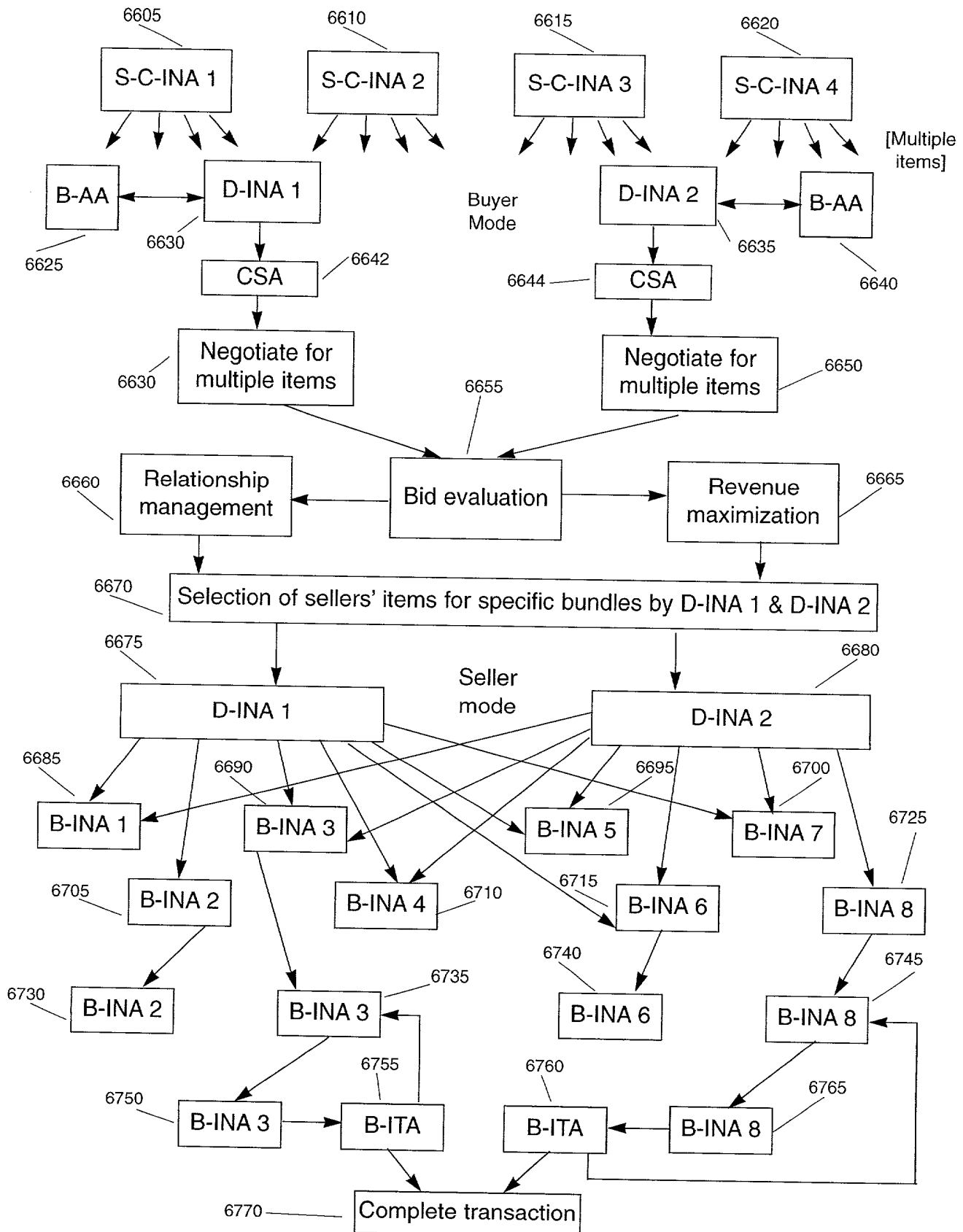


Fig. 64: Multifactorial Bidding Approaches

Sorting By Item Variables

Quality

Attribute – color, style, etc.

Quantity

Availability (now or later)

Delivery Time & Terms

Size

Dynamic Pricing Across product/service cycle

Brand/manufacturer

Configuration

Features

Additional options

Combinations of various features

Price

Payment Method

Payment Terms

Location

Fig. 65: Example of Multiple Feature Factors: Personal Computer Configurations

Manu.	CPU/ Mother board	Brand	OS	RAM	HDD	Modem & ISP contract.	DVD	Monitor	Price
Intel	500-ABC	IBM	MS	64	10	56 kbs	DVD	15 in	
Intel	500-ABC	Dell	MS	128	10	56 kbs	DVD	17 in	
AMD	500-XYZ	Gateway	MS	128	20	56/ISP	DVD	19 in	
AMD	800-XYZ	HP	MS	128	0	56/ISP	DVD	17 in	
AMD	800-ABC	IBM	MS	256	20	56/ISP	DVD	17 in	
AMD	800-ABC	Dell	Linux	256	20	128	DVD-RAM	17 in	
Intel	800-ABC	Gateway	Linux	256	30	128	DVD-RAM	17 in	
Intel	800-ABC	HP	Linux	256	30	128	DVD-RAM	17 in	
Intel	1.2-XYZ	IMB	Linux	256	30	128/ISP	DVD-RAM	17 in	
Intel	1.2XYZ	Dell	Linux	256	40	128/ISP	DVD-RAM	17 in	
Intel	1.2-ABC	Gateway	MS	256	40	128/ISP	DVD-RAM	19 in	
Intel	1.2-ABC	HP	MS	256	40	256	DVD-RAM	19 in	
AMD	1.2-ABC	IBM	MS	256	40	256	DVD-RAM	19 in	
AMD	1.2-ABC	Dell	MS	512	60	256	DVD	19 in	
AMD	1.2-XYZ	Gateway	MS	512	60	256/ISP	DVD	19 in	
AMD	1.8-XYZ	HP	MS	256	60	256/ISP	DVD	19 in	
AMD	1.8-XYZ	IBM	Linux	256	60	1.2mbs	DVD-RAM	21 in	
Intel	1.8-XYZ	Dell	Linux	256	80	1.2mbs	DVD-RAM	21 in	
Intel	1.8-XYZ	Gateway	Linux	512	80	1.2mbs	DVD-RAM	21 in	
Intel	2.4-ABC	HP	Linux	512	80	1.2/ISP	DVD-RAM	21 in	
Intel	2.4-ABC	Sony	MS	512	120	1.2/ISP	DVD	21 in	
AMD	2.4-ABC	Sony	MS	1.2	120	1.2/ISP	DVD	21 in	

Quantity – Discounts – 2-5, 5-9, 11-19, 21-29, 30-99, 100-499, 500-1999, etc.

Fig. 66: Examples of Categories of Multi-item Bundles

1. Computer Hardware configurations – RAM, HDD, CPU, monitor
2. Computer Hardware& Software
3. Computer Hardware & Services
4. Office equipment computer, printer, copier, fax, phone
5. Telephone equipment & services – local and long distance
6. Telecom capacity – rev. maximization across demand cycle
7. Electronic equipment – A/V combinations & software accessories
8. Photo equipment – camera, lenses, accessories, film, digital media
9. Airline tickets – time constraints to sell multiple seats to maximize revenue
10. Machines, machine parts, machine accessories
11. Cars/trucks & accessories
12. Wardrobe combinations, pants, shirts, coats
13. Real Estate – contiguous properties
14. Communications spectrum – contiguous properties
15. Gems
16. Railroad & trucking scheduling
17. Art, antiques, rugs, etc.
18. Housing combinations
19. Intellectual Property combinations
20. Pharmaceuticals
21. Chemicals

Fig. 67: S-ITA System Architecture

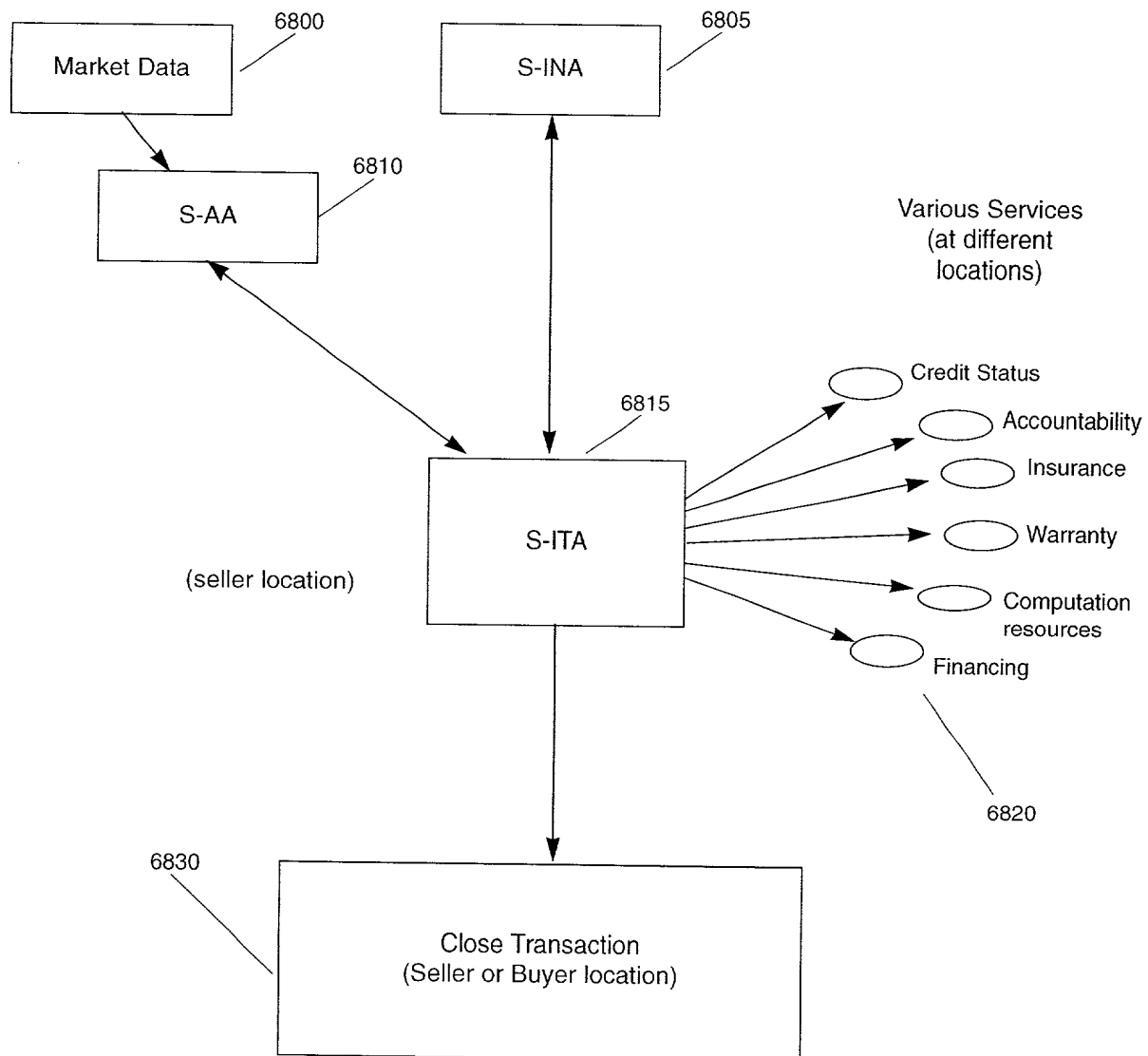
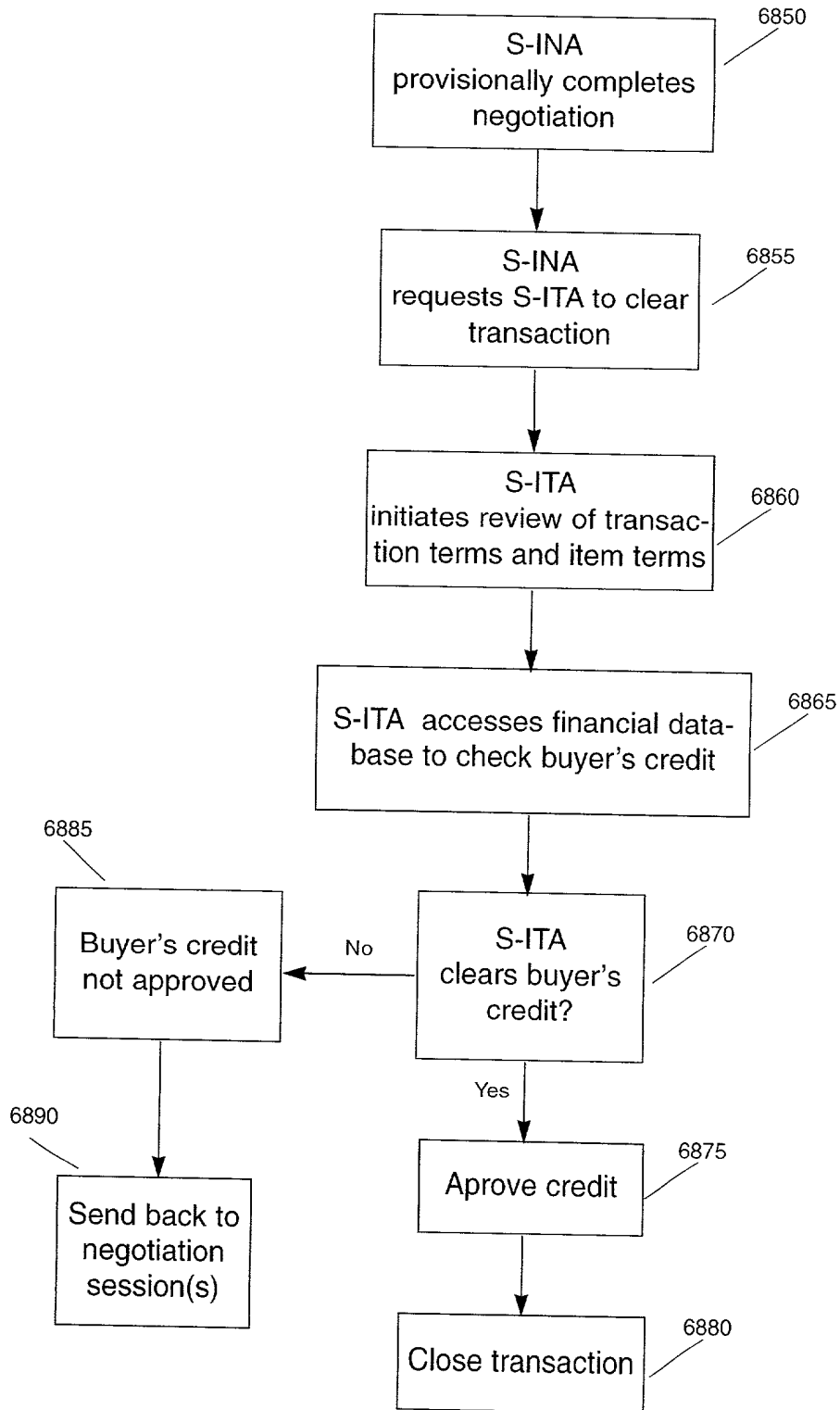


Fig. 68: S-ITA Operation



**Fig. 69: S-ITA and B-ITA System Process
in Final Negotiation with One Seller**

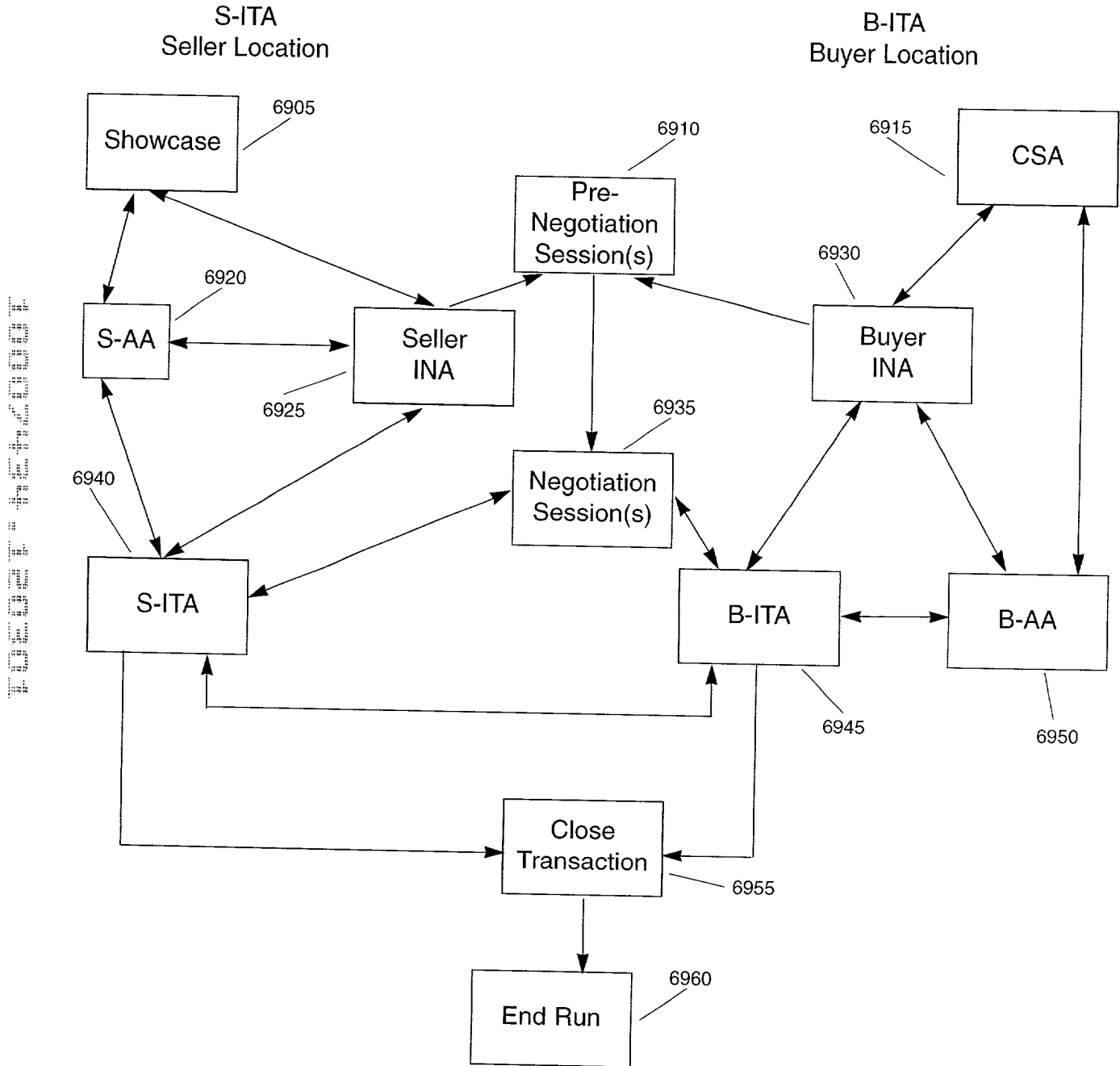


Fig. 70: ITA Service Categories: Buyer & Seller Roles

<u>s – ITA Services</u>	<u>b – ITA Services</u>	<u>dual – ITA Services</u>
<u>Info.</u>	<u>Info.</u>	<u>Info.</u>
<u>AA functions</u>	<u>AA functions</u>	
Superscore	Info about market, companies.,	
Accountability	economy, industry,	
Credit info.	products, etc.	
<u>Services</u>	<u>Services</u>	<u>Services</u>
Compliance – legal	Promotion discounts	Compliance – legal
Compliance – tax	Warranty	Compliance – tax
RMO's	Insurance	RMO's
finance/credit		finance/credit
payment processing		payment processing
Fulfillment – shipping/tracking		Fulfillment – shipping/tracking
due diligence		due diligence
escrow		escrow
report generator		report generator
post-sale feedback		post-sale feedback

Fig. 71: ITA Services

Accountability index  prior experience online
credit score & credit check

Financial credit module

— matching buyer with appropriate lender

Contracting module

Compliance module

Legal compliance

Federal/state/international rules

Tax compliance

International customs compliance

Risk management options

Payment processing module

— method of payments

— billing/invoice

— financial clearing and account crediting

Shipping/ delivery terms/tracking

Warranty Info & conditions

Insurance risks

Bookkeeping & accounting function

Due diligence

Escrow process

Report generator

Accelerated processing for high rated customer

Post sale feedback

Fig. 72: B-INA Micro-agents with Mobility

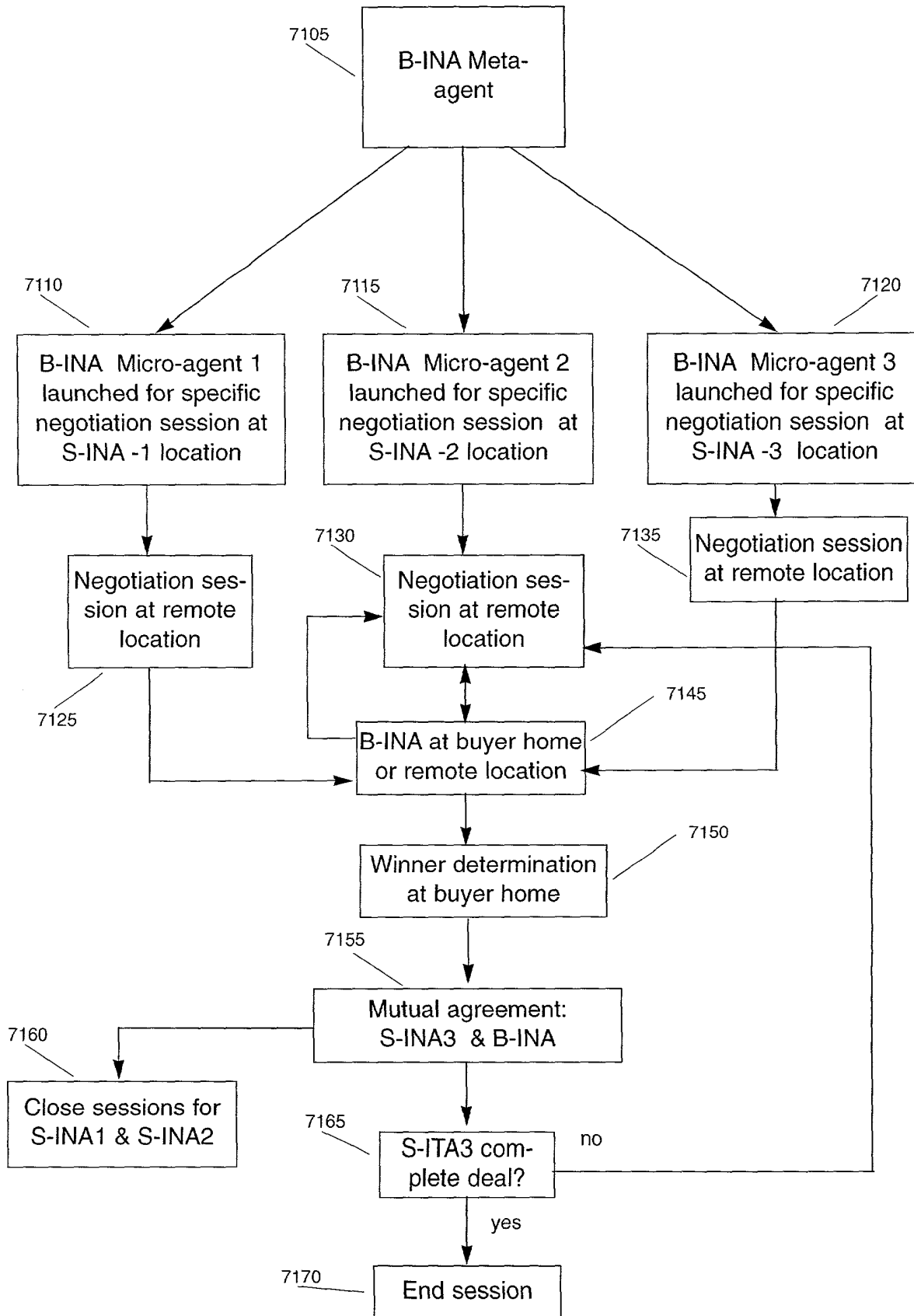


Fig. 73: Genetic Algorithms Applied to Multi-Agent System

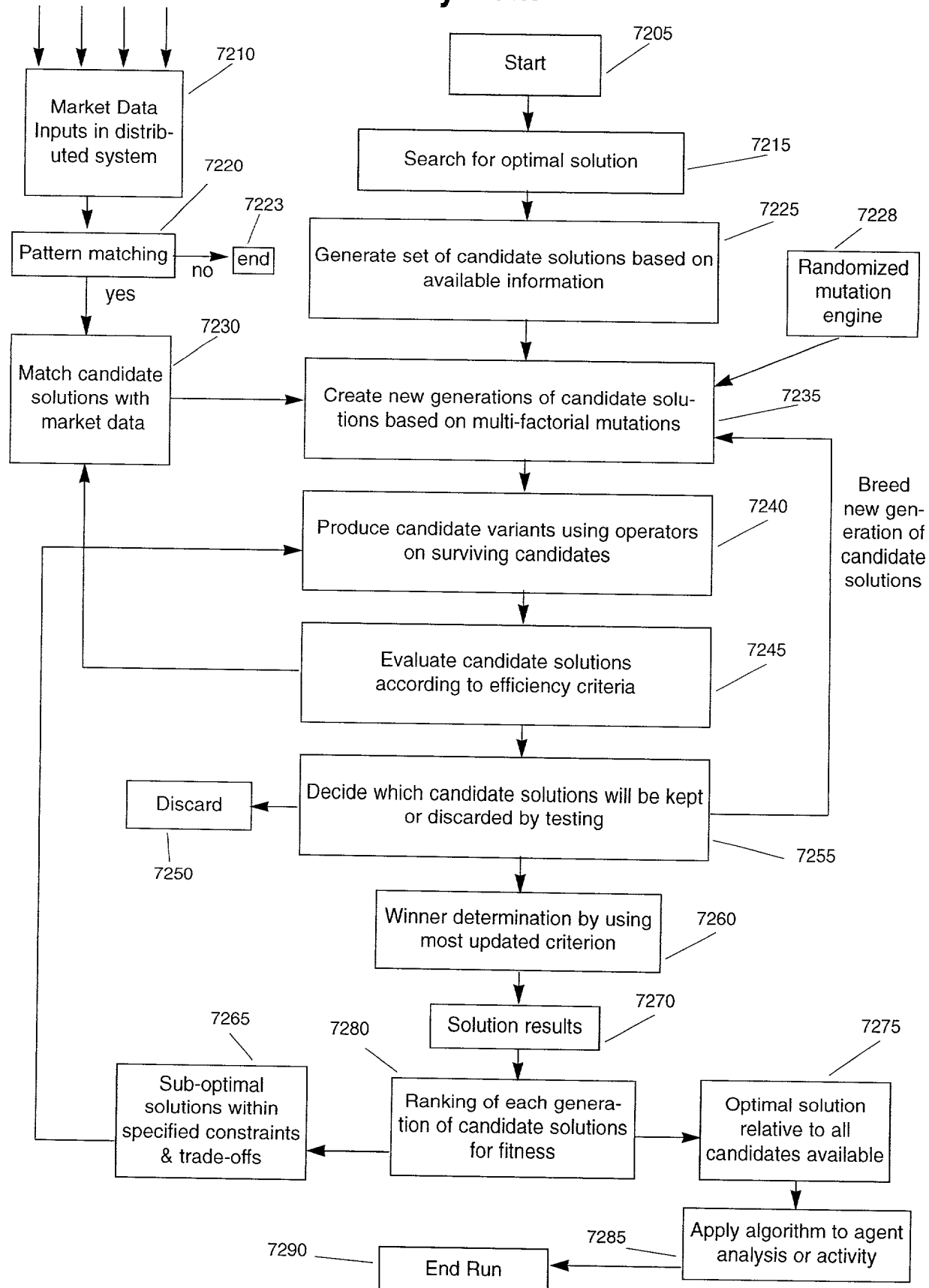


Fig. 74: Neural Networks Applied to Multi-Agent System

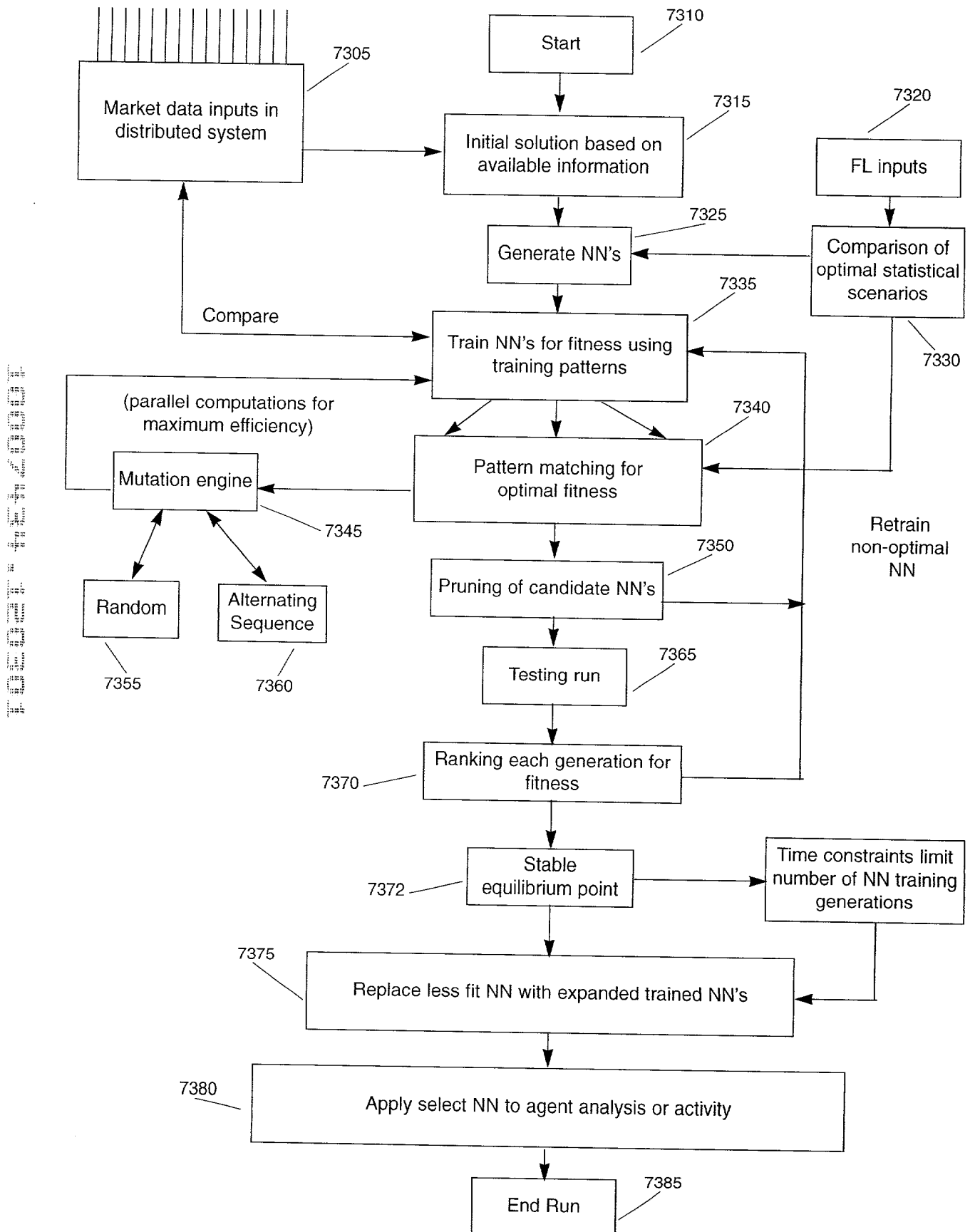


Fig. 75: Genetic Programming System Process

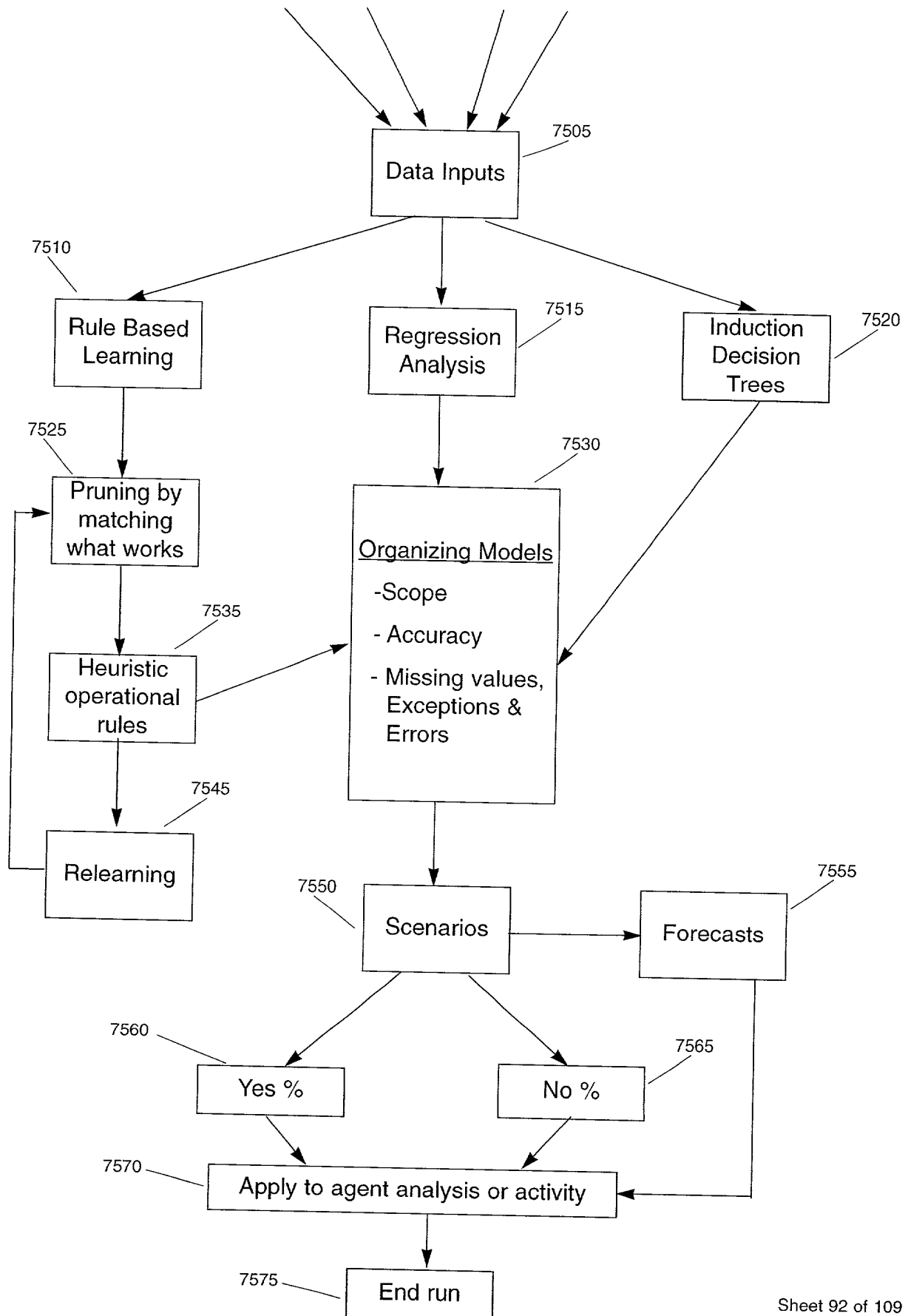


Fig. 76: Genetic Programming Learning Schemas

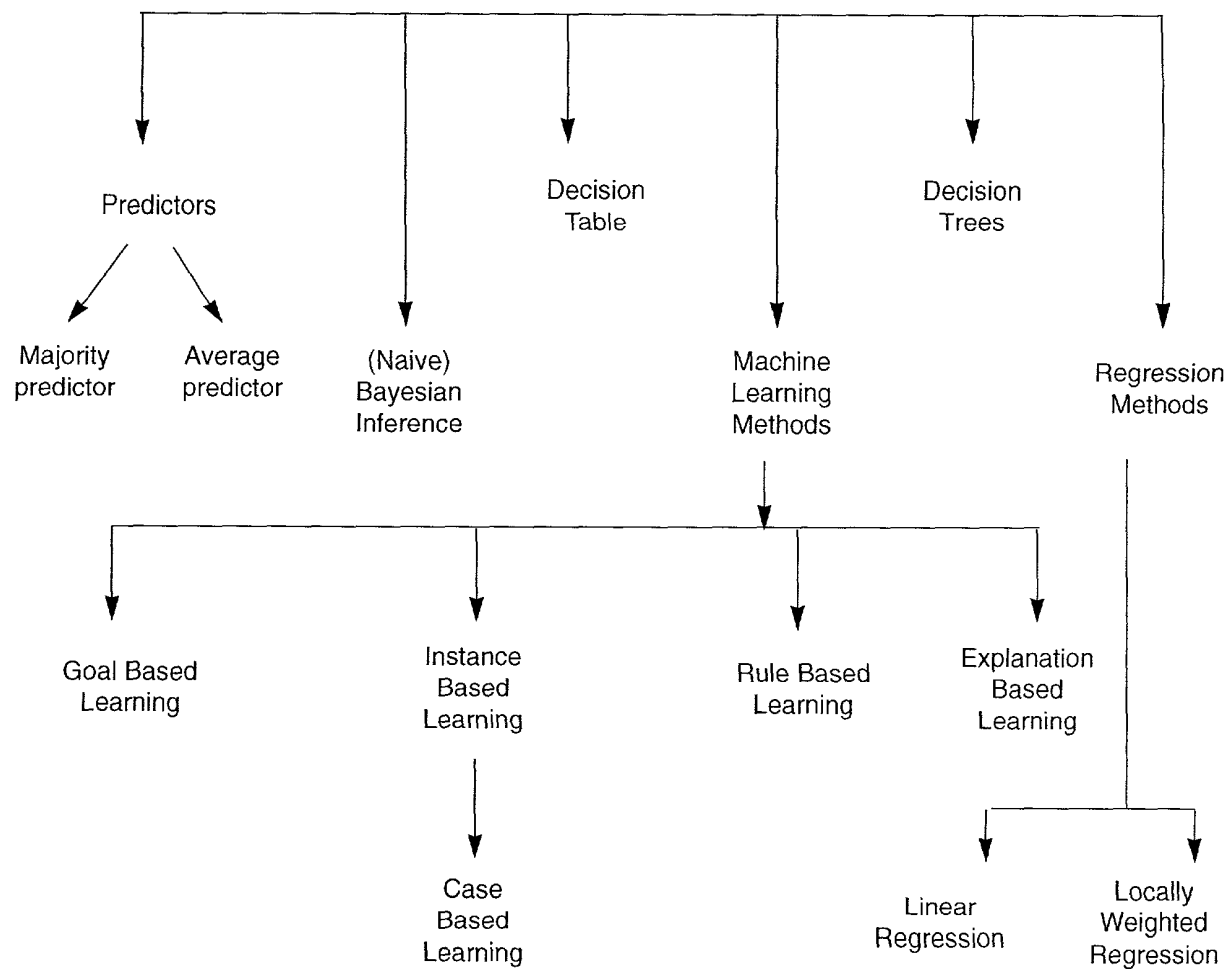


Fig. 77: Evolutionary Computation Applications to Agents

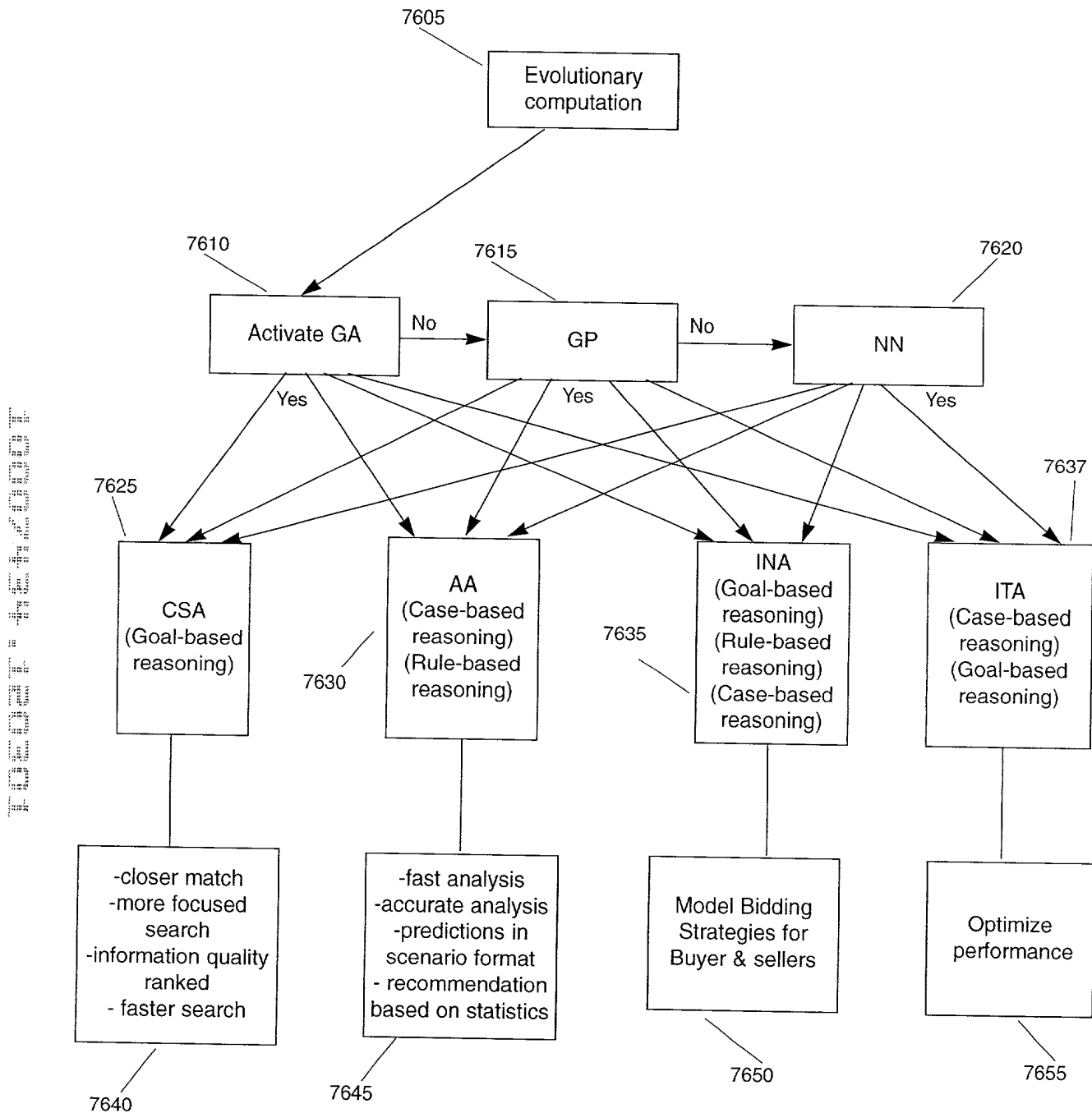


Fig. 78: AI Applied to Agency in a Distributed System

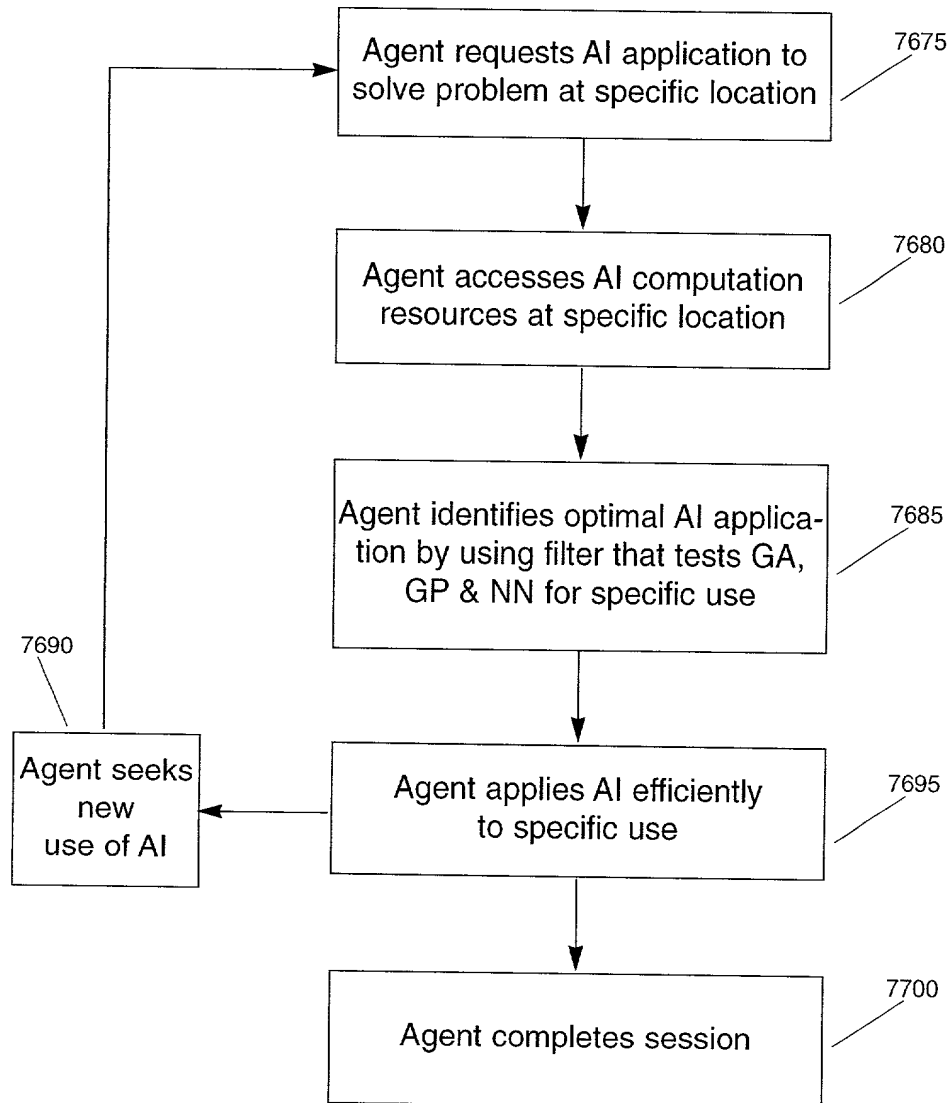
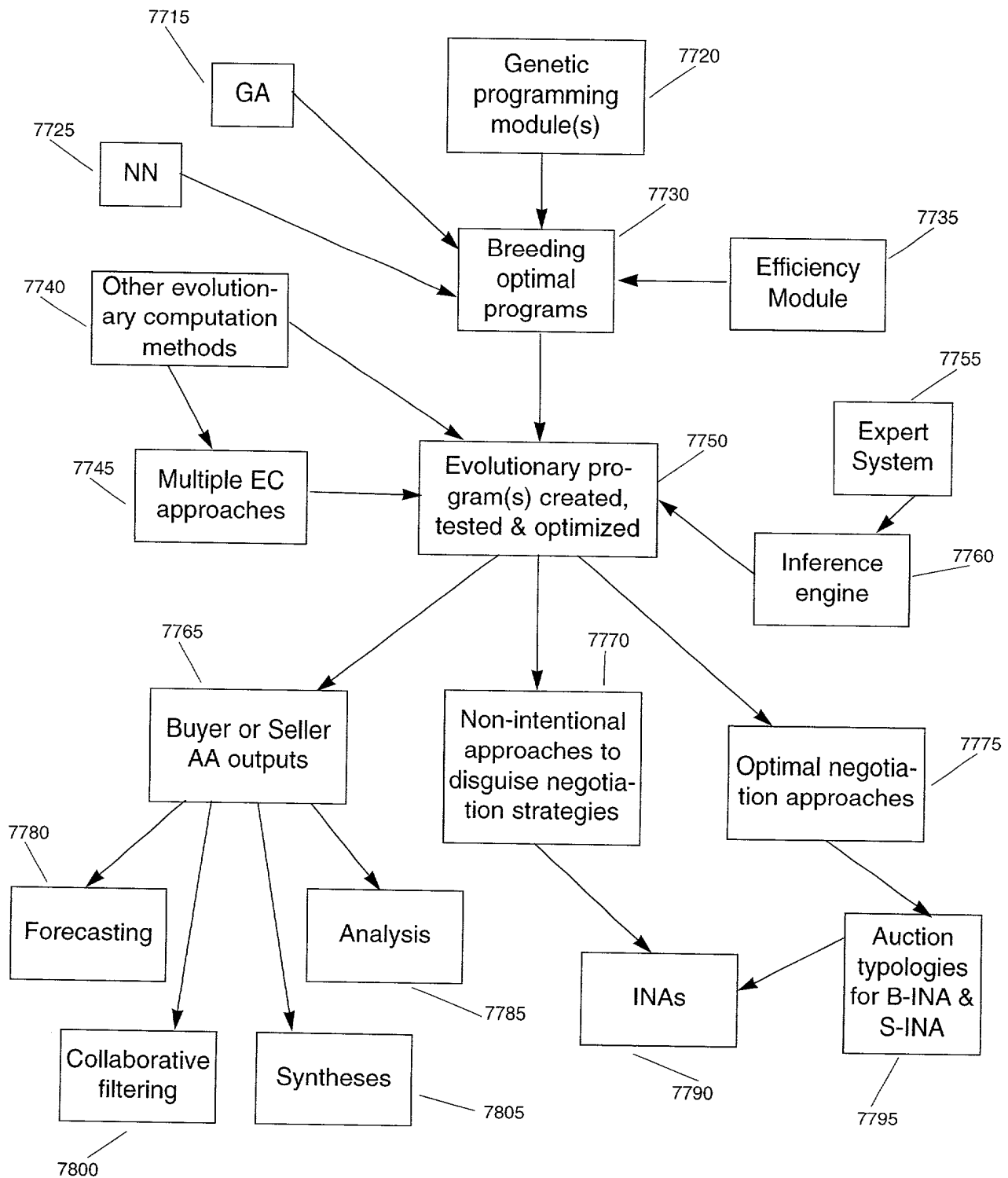


Fig. 79: Evolutionary Computation Architecture and AA/INA Applications



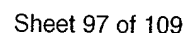
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Fig. 81: Analytical Agent System Architecture
Buyer vs. seller viewpoints

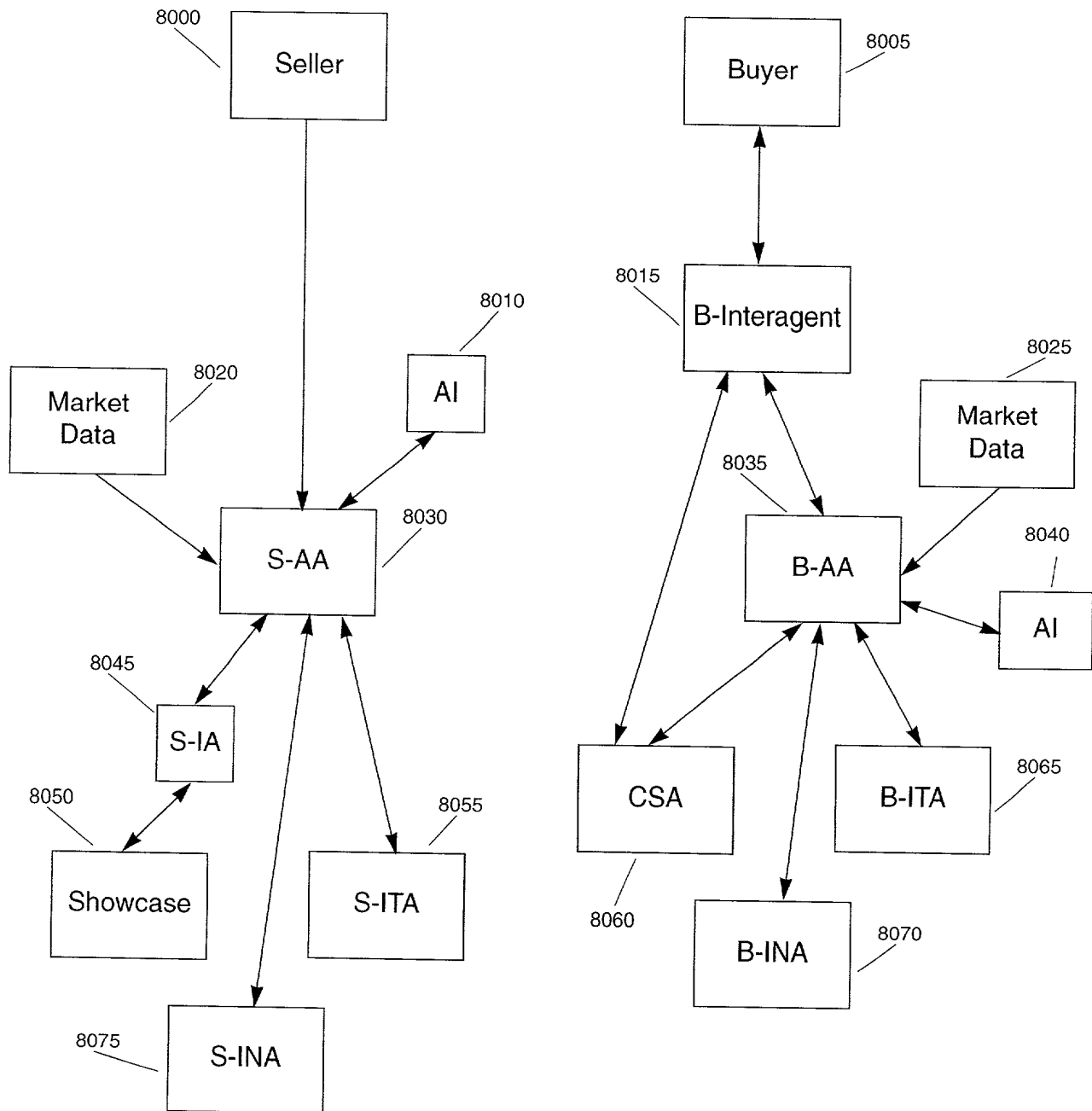


Fig. 82: Kinds Of Data Analysis & Syntheses

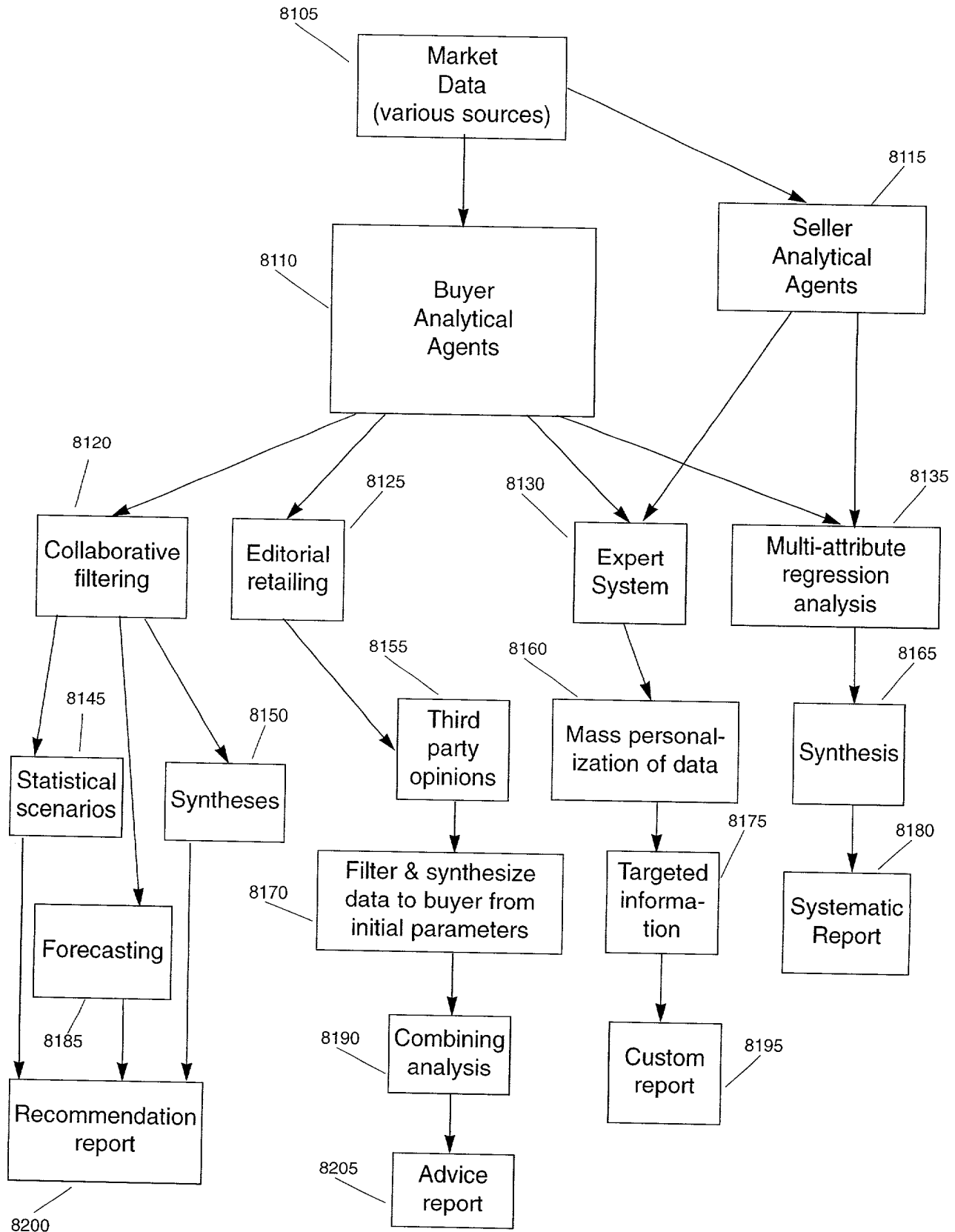


Fig. 83: Analytical Agent Data Flow Process

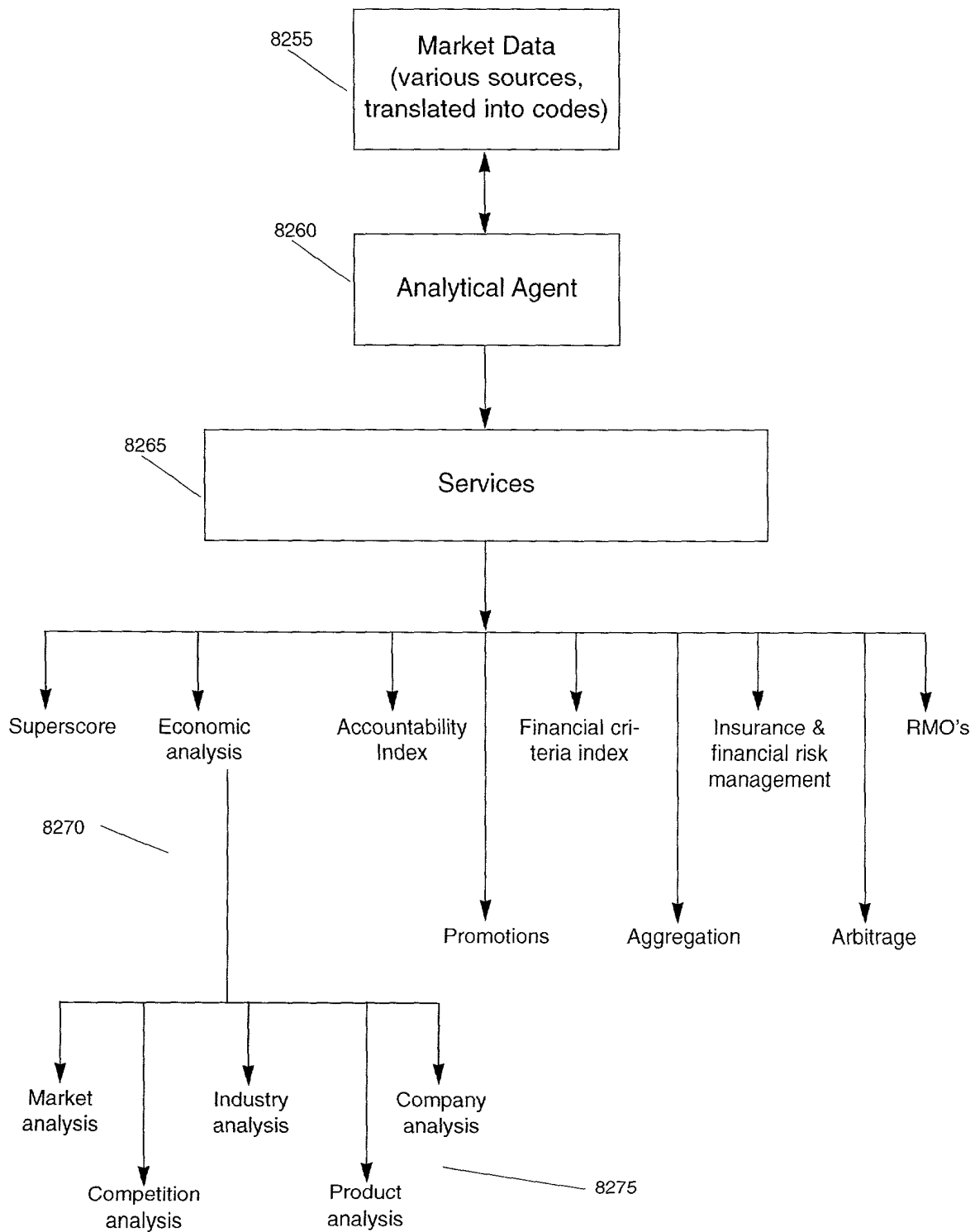


Fig. 84: Data Mining Approaches
CSA & AA interactions

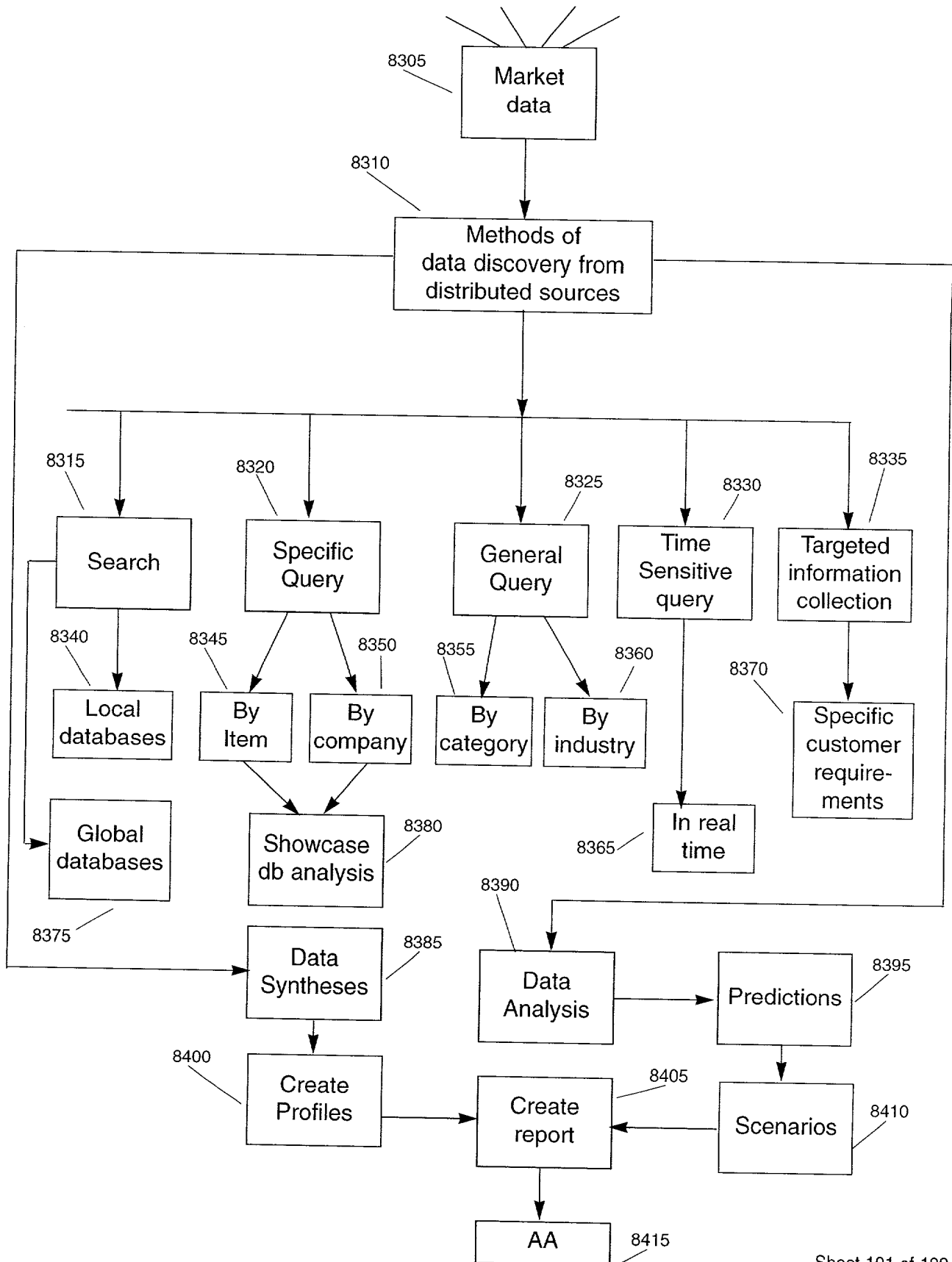


Fig. 85: Advanced Collaborative Filtering for Cross Marketing Recommendations

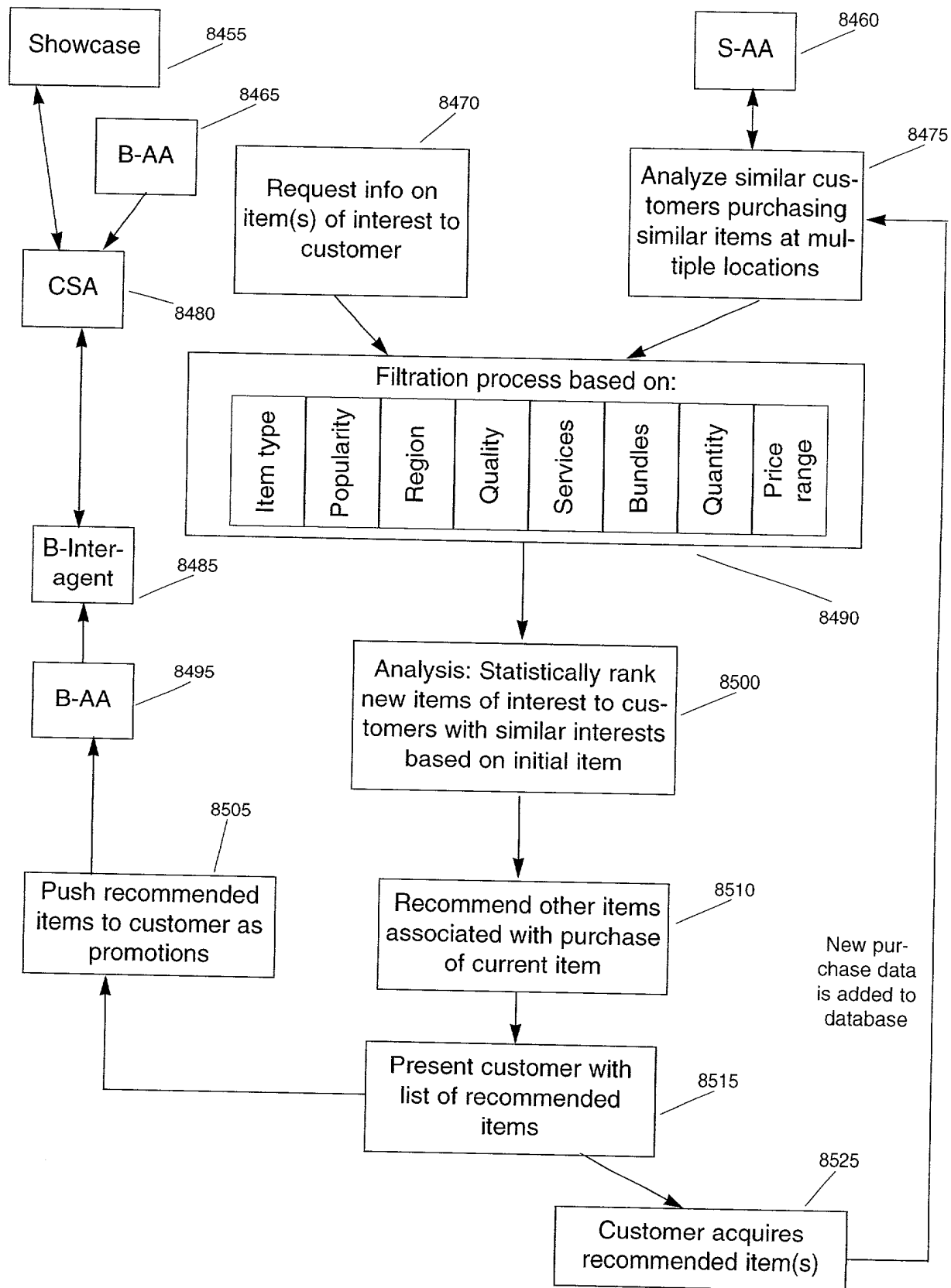


Fig. 86: B-AA Operations With Mobility

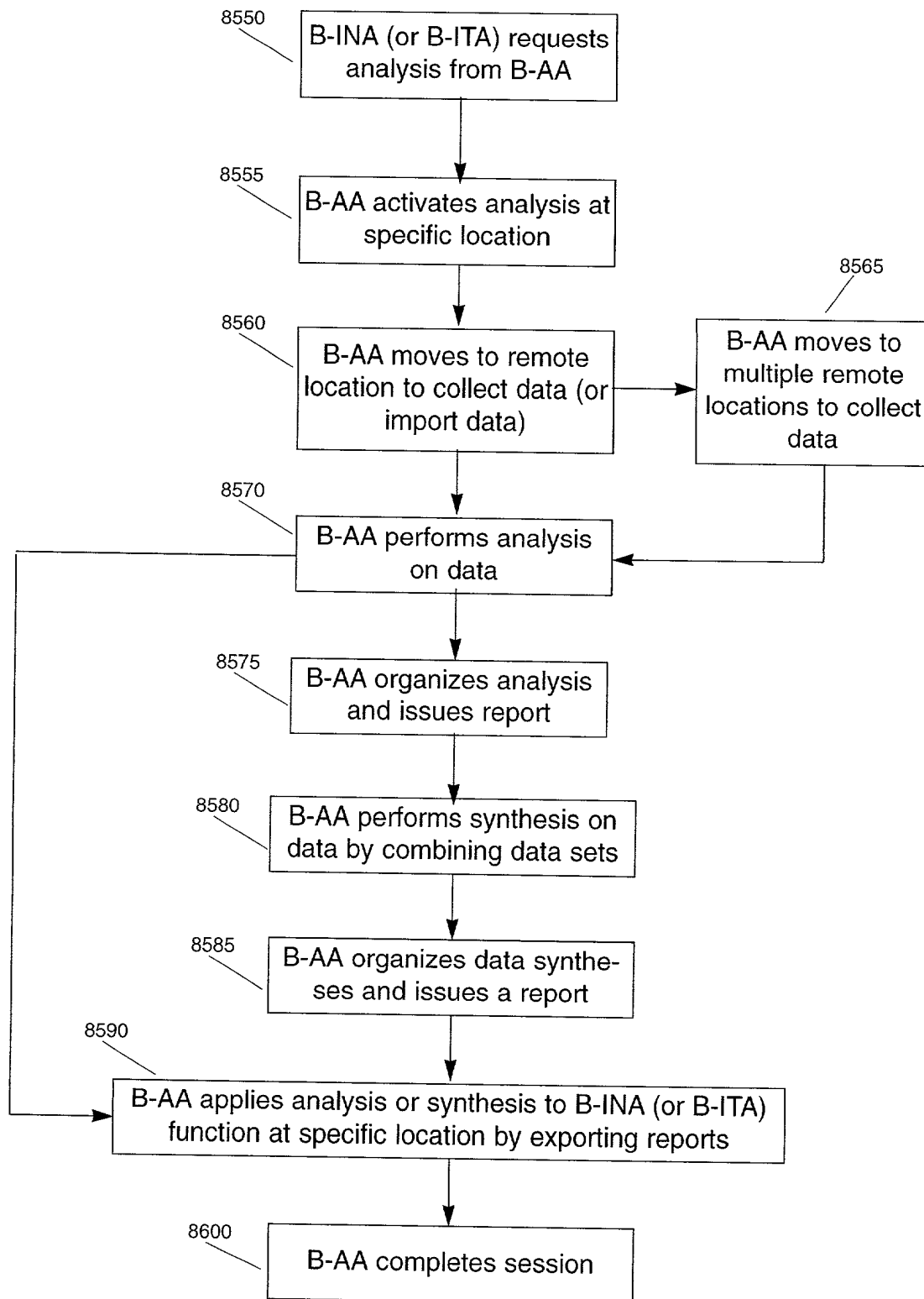


Fig. 87: Super-Score System: Negotiated Variables

1. Object Description – need reference to adaptable tables
2. Seller Description
3. Buyer Information
4. Buyer Credit Data
5. Finance opportunities – credit
6. Seller Promotions
7. Risk Management Options
8. Market Data on Multiple Sellers & Buyers

1

2

3

4

5

6

7

8

9. Industry Code
10. Unit Quantity
11. Unit Quality
12. Time to deliver
13. Bundling code — discounts
14. After Sales rating code
15. Quantity Code – each # signifies group category 1-100, 100-1000 etc.
16. Location of Negotiations

9

10

11

12

13

14

15

16

Fig. 88: Economic/Market Analysis Variables

- 1. Industry Code
- 2. Industry Analysis
- 3. Product Analysis
- 4. Need Index of average prices for each main sector – trends, changes
- 5. Prices relative to market averages
- 6. Intra-company analysis of products/services – scope, growth rate change, etc. analysis of data
- 7. Probability scenarios of industry company
- 8. Broad Market Analysis (as service)
- 9. Economic indicators

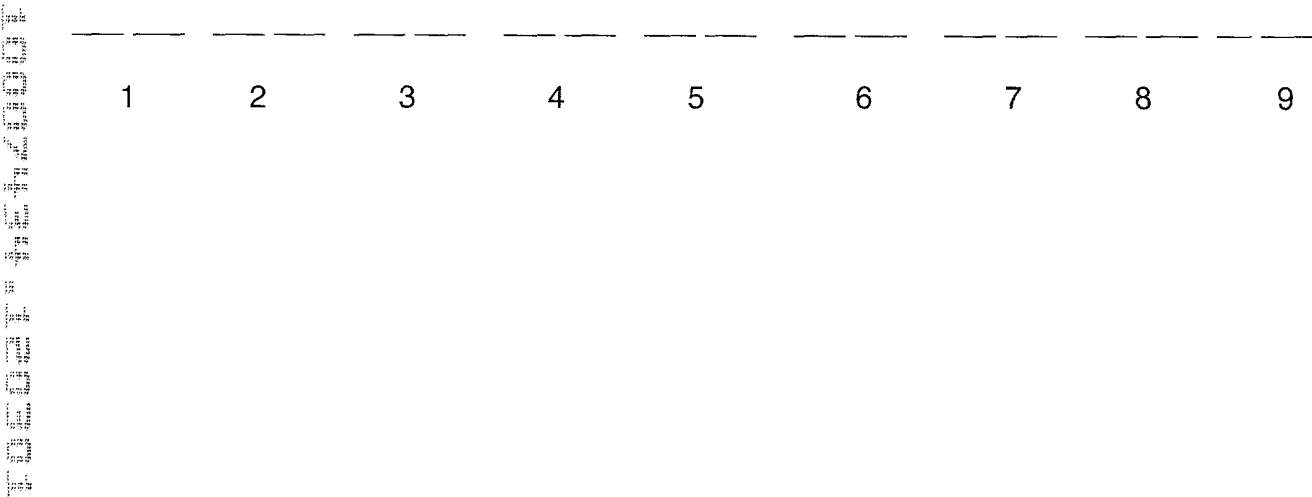


Fig. 89: Accountability Index System Variables

1. Bidding History
 - a. % bid
 - b. # of bids
 - c. % of bids won
 - d. # of bids won
2. Follow Up History
 - a. # & re-negs
 - b. # & returns
3. Credit History
 - a. credit limit
 - b. credit growth
4. Risk Factors
 - a. fast changes outside
5. Flexibility ratio
 - a. customer/seller as less rigid to accept deal
6. Tracking Pattern of Negotiation
 - a. figuring into accountability index
7. Transaction Prior Experiences
 - a. bidding history
 - b. success
 - c. problems
8. Follow through ratio
9. Accountability Index
10. Specify factors
11. Credit factors
 - a. debt ratio to net worth
 - b. paying on time
 - c. use up to limits, floating debt
 - d. credit limits
 - e. # of accounts
 - f. risk of default
12. Identify/authenticate agent/entity
13. Responsiveness to requests
 - a. In time factor

1

2

3

4

5

6

7

8

9

10

11

12

13

Fig. 90: Financial Criteria Index System

30+ Digit Code

1. Net Worth
2. Income
3. Cash Flow
4. Level of Debt to net worth
5. Public records
6. Value of assets
7. How much credit limit is used
8. How often up to (or over) limit
9. Financial Criteria factors
10. Length of credit accounts
11. Credit Limit
12. Unsecured vs. Secured debt
13. Derogatory Credit – over limit past due
14. Number of moves
15. Frequency of Place
16. Final Index Number to put in Super Score

30+ Digit Code

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

Fig. 91: Insurance Risk Factors

1. Use of Stats to establish rates
2. Kinds of losses specified
3. Claim-Adjustment Procedures
4. Claims Procedures
5. Errors
6. Omissions
7. Fraud
8. Accident
9. Premium Accounts
10. Limits/amounts of insurance
11. Full vs. Partial losses
12. Entity past record of claims
13. Costs of losses
14. Risks of specific events
15. Risk of limited loss
16. Risk of total loss

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16

Fig. 92: List Of Services

1. ITA (Transactions)
 - a. Actual banking services
 - b. Aggregation (for better deals)
 - c. Insurance
 - d. Warranties
 - e. Payment Processing
 - f. Tax Collection & Payments
 - g. Escrow
 - h. Due Diligence
 - i. Legal, tax, customs
 - j. Compliance
 - k. Accounting
 - l. Shipping/delivery
 - m. Delivery tracking
 - n. Post-sale reporting
2. AA (Analysis)
 - a. Economic analysis
 - b. Market/industry analysis
 - c. Company, product & service analysis
 - d. Financial & credit analysis
 - e. Accountability Indices
 - f. Superscore
3. Risk Management Options
 - a. Penalties for sellers not fulfilling by specified time
 - b. Risk priorities – order of preferred risks
 - c. Arbitrage penalties
 - d. Option swaps (exchanging opposing kinds of risks)
 - e. Dynamic pricing of risks based on peak/low risks environment
 - f. MTO Penalties
 - g. JIT Penalties
 - h. Risk Sharing
4. Promotions (CSA)
 - a. Discounts
 - b. Aggregation (group discounts)
 - c. Promotional guarantees
 - d. Promise to provide item by specific time
 - e. Quality increase offer
 - f. Bundling products & services
5. Insurance Risk Management
 - a. Liability (product/service, business, individual)
 - b. Dynamic pricing based on peak risks
 - c. E&O Fraud risks
 - d. Risk of event loss
 - e. Re-insurance – Insurance risk sharing
 - f. Accident risks
 - g. Degrees of losses
6. Financial Risk Management
 - a. Credit analysis /buyer, seller
 - b. Secured debt – kinds of assets
 - c. Unsecured debt
 - d. Structured fin.-by asset category (securitization of assets/debt)
 - e. Packaging debt
 - f. Packaging Ins. & Fin. Opportunities
7. Additional Services
 - a. Bundling products &/or services
 - b. Customized orders
 - c. Mass-customization
 - d. Just-in-time items
 - e. Aggregation of bundles
 - f. Arbitrage of items & bundles
 - g. Computation resources
 - h. Bandwidth resources